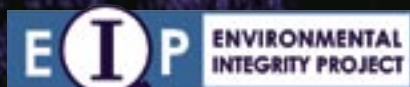




Gaming the System

**How Off-the-Books
Industrial Upset
Emissions
Cheat the Public
Out of Clean Air**



August 2004

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Environmental Integrity Project

AUGUST 2004

THE ENVIRONMENTAL INTEGRITY PROJECT (EIP) is a non-profit, non-partisan organization dedicated to more effective enforcement of existing federal and state environmental laws and to the prevention of political interference with those laws. EIP's research and reports shed light on how enforcement and rulemaking affect public health. EIP also works closely with local communities seeking the enforcement of environmental laws.

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Air pollution limits are designed to keep the air safe to breathe. Unfortunately, loopholes in the law render some of these limits virtually meaningless. Upset loopholes, in particular, allow industrial sources to pollute significantly more than the law allows. Upsets are non-routine events, such as equipment breakdowns, startup, shutdown and maintenance, at industrial facilities that cause them to emit more pollution than allowed by their permits and applicable rules.¹ As the result of upsets, pollution is often routed to a flare or vented directly to the air and normal pollution controls are bypassed.

Industry data show that upsets are causing air pollution in amounts above legal limits and, in some cases, far exceeding annual reported emissions. While all pollution in excess of permit or rule limits is illegal under the Clean Air Act, approximately half of the states have created loopholes that allow pollution resulting from upsets to exceed those

limits. To make matters worse, many states fail to track upset pollution or to include it in state inventories used to develop pollution control plans.

Our review of industry-filed reports and state rules found the following:

- *Upset emissions release toxic and carcinogenic chemicals that threaten the health and safety of communities already overburdened with toxic pollution.* For example, the upset emissions alone from BASF in Port Arthur, Texas, make it the sixth largest emitter of butadiene and the twelfth largest emitter of benzene in the country. Benzene and butadiene are both carcinogens, and Port Arthur is already home to many of the top national sources of butadiene.
- *Illegal loopholes allow upset emissions to exceed pollution limits.* Over half of the states excuse some upset emissions from compliance with pollution limits. In many of these states, facili-

ties essentially get a “get-out-of-jail-free card” for upset emissions. See Appendix A.

- *Loopholes in the law and lack of reporting allow upset emissions to be kept off-the-books.* Many states fail to accurately track the amount of pollution emitted during upsets. As a result, this pollution is kept “off-the-books” and is left out of models and plans for clearing the air.²
- *Annual upset emissions can actually exceed the total annual emissions a company reports to the state.* Upsets result in large emissions that may or may not be included in the emissions totals facilities must report to the state every year. More than half of the 37 facilities studied had upset emissions of at least one pollutant that were 25% or more of their total reported annual emissions of that pollutant. For ten of the facilities, upset emissions of at least one pollutant actually exceeded

the annual emissions each facility reported to the state for that pollutant. Upset emissions of carbon monoxide (CO) from Exxon Mobil’s Baton Rouge facility were almost three times its reported annual CO emissions.

Four of the six natural gas plants’ 2003 upset emissions of volatile organic compounds (VOCs) were greater than the total VOC emissions each plant reported to the state in 2002. The Boyd Compressor Station in San Angelo, Texas, released 50 times its total reported 2002 VOC emissions. Likewise, the one carbon black facility included in the study, the Sid Richardson Carbon facility in Borger, Texas, emitted VOCs through upsets that were 85 times its 2002 reported emissions.

- *Upset emissions are largely avoidable.* A handful of plants appear to have minimized upset emissions, thereby proving that pollution from upsets is not an inevitable product of manufacturing. Better management practices would significantly reduce upset emissions.

Hilton Kelley, Port Arthur, TX

“Whenever an upset takes place, you see the flares from these eighty to a hundred foot towers.... If it is night the sky is a bright orange and the strong chemical and sometimes ammonia odors burn your eyes and make you cough; many times people have to go to the hospital because of nausea, skin irritation and asthma attacks.... Whenever someone dies in Port Arthur it’s usually because of cancer. We have lived with this environmental injustice for many years and the sad fact of the matter is that for years industry has known about the dangerous impact of these chemicals on the human body and yet they have operated out of compliance and dumped tons of illegal emissions on our community.... Port Arthur is home to 57,755 people with a strong sense of community and we are standing together and fighting for our kids, our elderly and our selves to have clean air. It’s our God given right to have clean air.”

Upsets (including malfunctions, startups, shutdowns and maintenance) frequently result in large emissions over short periods of time. The pollution includes toxics and carcinogens that can affect the health of nearby communities. Upsets are a significant problem for many areas, including rural ones, but they are a particular problem for the predominantly low-income communities of color surrounding many refinery and chemical complexes.

The stories from these communities around the country are similar—from burning throats and eyes, difficulty breathing, and high asthma rates to rare cancers and high rates of hysterectomies among young women. People living near clusters of large industrial sources are told by regulatory agencies not to worry, that permits and regulations are in place

to keep the air safe, but common health problems in these communities suggest something is wrong.

Part of the problem is upset emissions. For example, BASF's Port Arthur facility released over 174,665 pounds of the carcinogens benzene and butadiene during upsets (including malfunctions, startups, shutdowns and maintenance) in one year. Yet, regulatory agencies rarely acknowledge the alarming magnitude of these emissions, or the fact they are often not subject to permits or regulations.

Industry, primarily the refining and power companies, continues to push for "streamlined" federal air pollution permitting and "relaxed" monitoring requirements. A recent bill by Congressman Barton, which passed the U.S. House of Representatives, would effectively relax air pollution requirements for refineries in areas with high unemployment.³ Data reviewed for this report show that low income communities, like those targeted by the Barton bill, are already being exposed to high levels of toxic pollution as a result of existing loopholes in the law. "Streamlining" requirements to create additional loopholes will only increase this pollution and the harm it causes.

The pollution caused by upsets is at least as harmful as "routine" pollution and should not be allowed to evade emission limits designed to protect public health. Many upsets are avoidable. Some refineries report far fewer emissions from such events than others. If the reporting data is accurate, this means facilities are capable of reducing the number of upsets. A handful of facilities and states have begun to look more closely at upsets and the role they play in overall air quality. We hope this report will encourage EPA and additional states and facilities to do the same, and to take action to reduce the amount of pollution in the air due to these events.

Recommendations

Eliminate Loopholes: EPA should eliminate the upset exemptions and defense provisions in its permitting rules and in State Implementation Plans. In addition, EPA and states should ensure that upset emissions are considered when issuing permits, tallying annual emissions and developing pollution reduction plans.

Improve Monitoring and Reporting: States should require facilities to utilize the best technologies available for monitoring sources of upset emissions, including flares, valves and cooling towers. They should centrally track all excess emissions, including those caused by upsets, and make this information easily accessible to the public using an electronic reporting system like that in Texas. States should require facilities to report excess emissions electronically within 24 hours, and immediately for toxics, and the public should be able to access these reports through state agency websites within 72 hours.

Increase Enforcement: EPA and states should prioritize enforcement actions for illegal upset emissions. States should make penalties for upset emissions automatic, based on the amount and toxicity of the emissions, and require reductions in routine emissions to offset releases from these events. Making all excess emissions subject to regulation, enforcement and offset provides an incentive for facilities to prevent upsets and reduce air pollution. In addition, permits should require facilities to shut down once they exceed a certain number of upsets.

Study Health Effects: Although communities near refinery and chemical complexes are exposed to a large volume of toxic emissions, there have been few studies of the health effects of such exposure. EPA and states should make funding these studies a priority.



What is being emitted?

Upsets are a significant source of air pollution. In some cases, releases from upsets actually dwarf a facility's routine emissions. We obtained upset reports filed by 57 facilities in five states. While the reporting in several of these states was so inadequate that we could not track upset emissions, data available in two states provides a glimpse of the extent of the problem.

The reported emissions from upsets (including malfunctions, startups, shutdowns and maintenance) from thirty facilities in Texas and seven facilities in Louisiana are included in Table 1. In total, these 37 facilities released at least 63,411,603 pounds of pollution as a result of upsets over a one year period.⁴ This is more than 3½ times the total pollution from all facilities in Dallas County, Texas.⁵

The facilities studied include refineries, chemical plants, gas plants and a car-

bon black plant, all of which have been found to be significant sources of upsets.⁶ We tracked emissions of nitrogen oxides (NO_x), sulfur dioxide (SO₂), hydrogen sulfide (H₂S), CO and VOCs—including benzene and butadiene.⁷

In sum, CO was released in the largest quantities, followed by VOCs, SO₂, NO_x, and H₂S respectively. See Figure 1.

FIGURE 1. UPSET EMISSIONS BY POLLUTANT

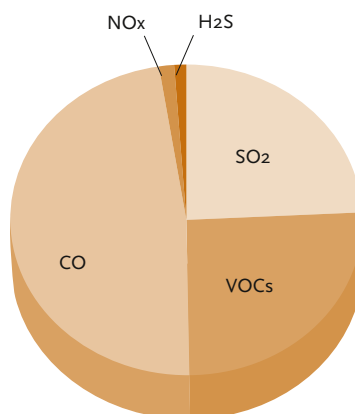


TABLE 1. UPSET EMISSION TOTALS

Facility	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene	Butadiene	Total ⁸
TX 2003 upsets								
Blalock Booster Station (Garden City, TX)	0	0	0	0	1,230,475	0	0	1,230,475
SACROC CO ₂ (Snyder, TX)	155,082	12,846	137,277	39,520	1,368,913	0	0	1,713,638
Welch CO ₂ Gas (Welch, TX)	213,910	2,319	17,245	2,011	17,029	0	0	252,514
Boyd Compressor Station (San Angelo, TX)	0	0	0	0	3,550,022	2,792	0	3,550,022
Goldsmith Gas Plant (Goldsmith, TX)	3,262,402	79,929	164,718	42,678	3,363,410	0	0	6,913,137
Wasson CO ₂ Removal (Denver City, TX)	384,612	4,162	184,077	25,677	142,183	0	0	740,711
BASF (Port Arthur, TX)	1,776	0	570,789	134,114	1,523,983	91,274	83,391	2,230,662
BP Plant B (Texas City, TX)	6,000	0	1,166	1,111	50,199	15,250	30	58,476
Dow (Freeport, TX)	8	12	309,036	52,730	781,597	11,173	8,109	1,143,384
Equistar (Channelview, TX)	0	0	173,117	23,804	271,544	14,233	17,663	468,465
Equistar (Deer Park, TX)	0	0	52,643	10,055	97,944	231	926	160,642
Equistar Chocolate Bayou (Alvin, TX)	0	0	101,286	14,085	132,734	4,435	10,106	248,105
Exxon Chemical (Baytown, TX)	41,094	448	8,204	982	13,333	8	8	64,061
Exxon Olefins (Baytown, TX)	0	0	47,615	4,814	22,080	380	3,946	74,509
Huntsman (Port Neches, TX)	19	0	92,036	7,135	452,320	577	9,286	551,510
Huntsman Petrochemical (Odessa, TX)	0	0	15,675	6,752	358,734	3,797	2,369	381,161
Sid Richardson Carbon (Borger, TX)	0	309,170	11,691,373	1,801	461,523	0	0	12,463,867
Atofina (Port Arthur, TX)	5,012,808	95,983	43,323	16,808	24,600	443	0	5,193,523
BP Products North America (Texas City, TX)	219,857	6,721	498,955	18,952	294,206	6,650	313	1,038,691
Citgo East (Corpus Christi, TX)	73,252	230	465,904	3,554	42,930	7,920	0	585,870
Exxon (Baytown, TX)	598,756	6,821	591,139	57,613	188,538	202	311	1,442,867
Exxon Refinery (Beaumont, TX)	247,846	3,945	695,345	6,863	346,541	16	19	1,300,540
Flint Hills West (Corpus Christi, TX)	84,803	2,967	260,516	1,717	37,156	364	0	387,159

Upset Emission Totals

Facility	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene	Butadiene	Total ⁸
Flint Hills East (Corpus Christi, TX)	36,495	0	10,780	6,804	3,800	5	30	57,879
Motiva (Port Arthur, TX)	97,871	2,764	10,688	12,735	390,852	15	453	514,910
Phillips 66 (Borger, TX)	243,756	1,757	252,401	47,524	80,517	1,488	0	625,955
Premcor (Port Arthur, TX)	407,486	4,739	15,088	10,910	56,706	2,094	0	494,929
Valero East (Corpus Christi, TX)	455,990	4,546	29,246	3,293	31,524	76	0	524,599
Valero West (Corpus Christi, TX)	613,268	6,515	118,232	39,154	52,974	45	0	830,143
Western Refinery (El Paso, TX)	141,196	1,541	411	487	8,518	200	0	152,153
LA 2001/2002 avg. upsets								
Murphy Oil (Meraux, LA)	135,716	28	165,782	23,030	26,082	0	0	350,638
Exxon Mobil (Baton Rouge, LA)	1,435,604	3,223	13,381,005	163,054	122,778	567	289	15,105,664
Chalmette Refinery (Chalmette, LA)	1,050,746	2,632	10,880	8,276	294,298	1,393	0	1,366,831
Citgo (Lake Charles, LA)	351,406	3,181	380	1,750	72,088	592	0	428,805
Motiva (Norco, LA)	25,086	194	44,456	153,263	36,286	187	417	259,285
Exxon Mobil Chemical (Baton Rouge, LA)	13,173	35	61,621	34,304	112,745	176	756	221,877
Shell Chemical (Norco, LA)	98,395	0	2,049	47,320	136,183	553	4,332	283,946
TOTALS	15,408,412	556,708	30,224,459	1,024,681	16,197,344	167,133	142,754	63,411,603

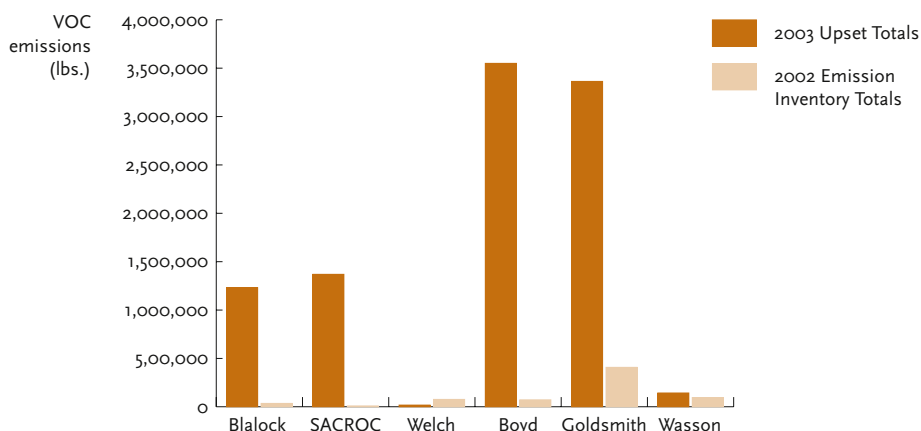
While refineries and chemical plants are the most notorious upsetters, and likely release the most toxic emissions in the closest proximity to large populations, the gas plants released an alarming amount of VOCs during upsets.

Natural Gas Plants: The six gas plants included in our review reported a total of 9,672,032 pounds of excess VOCs during upsets in 2003. Four of the gas plants also released significant quantities of SO₂.

To help gauge the magnitude of these upset emissions, we compared them to the total annual emissions reported by each facility to the Texas emission

inventory.⁹ The SACROC CO₂ plant's VOC upset emissions were 163 times the total annual VOCs it reported to the Texas emission inventory.¹⁰ The Blalock Booster Station's VOC upset emissions were more than 35 times the annual VOC emissions it reported to the emission inventory and Boyd Compressor Station's VOC upset emissions were almost 50 times the annual VOC emissions it reported to the emission inventory. See Figure 2.

Gas plants are obviously not including all of their upset emissions in the total annual emissions they report to the emission inventory. This leaves the state

FIGURE 2. NATURAL GAS PLANT UPSETS

with faulty information on which to base its air pollution control plans.

Refineries: The refineries included in the study released significant amounts of SO₂, CO and VOCs during upsets. Of 18 refineries, ten had annual upset releases of at least one pollutant amounting to more than one-quarter of

their emission inventory annual totals for that pollutant.¹¹ The Atofina Port Arthur facility's SO₂ upset emissions were 2 ½ times the total SO₂ emissions it reported to the Texas emission inventory. Likewise, the Exxon Mobil refinery in Baton Rouge, Louisiana, had upset emissions of CO that were almost three times the CO emissions it reported

TABLE 2: REFINERY ANNUAL UPSETS AND DAILY PRODUCTION CAPACITY

Refinery ¹²	Total Emissions from Upsets	Production Capacity (barrels per day)
Western Refinery – El Paso, TX	152,153	90,000
Valero (East & West) – Corpus Christi, TX	1,354,742	134,000
Premcor – Port Arthur, TX	494,929	255,000
Phillips 66 – Borger, TX	625,955	143,800
Murphy Oil USA – Meraux, LA	350,638	95,000
Motiva – Port Arthur, TX	514,910	250,000
Motiva – Norco, LA	259,285	219,700
Flint Hills (East & West) – Corpus Christi, TX	445,038	259,980
Exxon Mobile – Baton Rouge, LA	15,105,664	491,500
Exxon Refinery – Beaumont, TX	1,300,540	348,500
Exxon – Baytown, TX	1,442,867	523,000
Citgo – Lake Charles, LA	428,805	324,300
Chalmette Refinery – Chalmette, LA	1,366,831	182,500
BP Products North America – Texas City, TX	1,038,691	437,000
Atofina – Port Arthur, TX	5,193,523	175,068

to the Louisiana emission inventory. Table 2 shows total reported annual upset emissions and daily refinery capacity for the refineries studied. Atofina, which is one of the smaller refineries included in the study, had the second highest total upset emissions.

Chemical Plants: The chemical plants in the study released significant quantities of VOCs and CO during upsets. The largest source of total benzene and butadiene upset emissions was BASF in Port Arthur, Texas. That facility alone released 91,274 pounds of benzene and 83,391 pounds of butadiene in upsets in 2003. This compares to 2002 reported emissions totals for benzene and butadiene of 13,800 pounds and 133,900 pounds, respectively.¹³ Shell Chemical in Norco, Louisiana, reported releasing over 2,000 pounds of butadiene in one upset event, and more than 1,517 pounds of butadiene during another event.

Carbon Black Plant: The one carbon black plant included in our review, the Sid Richardson Carbon facility, released 461,523 pounds of VOCs and 11,691,373 pounds of CO during upsets in 2003. These upset releases were more than 85 times the total VOC emissions the facility reported to the emissions inventory and almost eight times the total CO emissions reported.

Why does it matter?

Health and Environmental Effects

The pollutants emitted during upsets can cause significant adverse health and environmental effects. They contribute to ozone formation, cause cancer, aggravate respiratory conditions and cause neurological and reproductive problems. See Table 3.

Because facilities like refineries and chemical plants are often clustered together, neighboring communities are sub-

ject to cumulative upset emissions. Toxic emissions are therefore of particular concern. Complaints by local community members, including reports of nausea, burning eyes and throat, difficulty breathing, and cancer clusters, are consistent with exposure to toxic emissions.

Just 37 of the facilities studied for this report released more than 167,133 extra pounds of benzene and 142,754 extra pounds of butadiene during one year's worth of upsets. Both benzene and butadiene are carcinogens associated with cancers including leukemia. Benzene is ranked by EPA as one of two chemicals posing the greatest national cancer risk. Butadiene is listed by EPA as one of the two most significant probable carcinogens contributing to regional cancer risk.¹⁴

Despite the clear toxicity of upset emissions, few health studies have been conducted in communities most affected by this pollution. Some communities around refinery and chemical complexes

Shonda Lee, New Sarpy, LA near Valero

It's at night that the flare blows, when we're sleeping. The rumbling, the noise. I hear it so clear at night. Especially at 2 or 3 in the morning, when we're really trying to sleep to get up for the next day...

My daughter wakes up in the middle of the night because she's afraid. She even had a nightmare the other night. She dreamed the other night that the refinery just blew up. "Mama I dreamed that those places just blew up and our house, our house was blown." Her sleeping pattern is irregular now, and that's bad on school.

It's really breaking our hearts. It has taken a toll health wise, I truly believe. The smell. Yesterday was so disgusting, yesterday I was in the car... and the smell was so awful, we were sick to our stomachs. We left New Sarpy and felt much better. We got back here and we were sick again. This is no lie, sometimes the smell is so bad I hang out of my door and throw up.

TABLE 3: RELEASES AND EFFECTS

	Releases	VOCs	SO ₂	NO ₂	CO	H ₂ S	Toxic Air Pollutants
Human Health Effects	Reacts with other chemicals to create particulate pollution that can cause respiratory illness, aggravation of heart conditions and asthma, permanent lung damage, and premature death.		◆	◆			
	Aggravates respiratory conditions.					◆	
	Reacts with other chemicals leading to ground-level ozone and smog, which can trigger respiratory problems.	◆		◆			
	Can cause health problems such as cancer.	◆					◆
	Can cause reproductive, neurological, developmental, respiratory, immune system, and other health problems.						◆
	Reacts with common organic chemicals forming toxins that may cause bio-mutations.			◆			
	Affects cardiovascular system and can cause problems within the central nervous system.					◆	
Environmental Effects	Causes haze that can migrate to sensitive areas such as National Parks.	◆	◆	◆	◆		
	Contributes to formation of acid rain, which damages crops, trees, and buildings; and increases acidity in soils, lakes, and streams.		◆	◆		◆	
	Contributes to the formation of ground-level ozone, which harms vegetation.	◆			◆		
	Contributes to global warming, which leads to rising sea levels and other adverse changes to plant and animal habitat.			◆			
	Causes environmental hazards, including concentration of toxic chemicals (e.g., mercury) up the food chain.						◆
	Settles on ground and water, acidifying streams and lakes, damaging forests and farm crops, and depleting soil nutrients.		◆				

SOURCE: EPA Office of Inspector General, "EPA Needs to Improve Tracking of National Petroleum Refinery Program Progress and Impacts" (June 22, 2004), Appendix D. Note: many VOCs are toxic air pollutants.

have compiled their own health surveys that clearly indicate something is wrong. Research into the long and short-term effects of the toxic soup that is emitted from many refining and chemical companies is desperately needed.¹⁵

Financial Effects

The adverse health effects likely caused by upset pollution cost states, as well as individuals, in terms of increased hospitalizations, lost work days and children with health problems and learning difficulties. In addition, the failure to regulate

upset emissions costs many states significant revenue. States normally require facilities to pay emission fees based on the amount of pollution emitted. Because facilities often underestimate or fail to report upset emissions, they avoid paying the full fees owed the state. Almost half of the states that responded to our survey said they either do not collect fees for upsets, or only sometimes collect fees for upsets. See Appendix A. This lost revenue is money that could be used to provide health clinics, medical services and health studies in the communities most affected by upset emissions.

How Can Upset Emissions Be Reduced?

Upset emissions are not inevitable. Our review of upset data shows that some facilities have significantly fewer upsets than others. Table 2, comparing refinery upset emissions to production capacity at refineries, shows that bigger facilities are not necessarily responsible for greater upsets. A combination of better management practices, adequate staffing and improved technologies could significantly reduce upset emissions.

A 2001 study by the state of Texas found that much upset pollution was due to the lack of best management practices.¹⁶ Facilities can do a number of things to reduce such emissions. The most obvious is to conduct a thorough root cause analysis for each upset event. This analysis helps facilities identify why upsets are occurring and what can be done to prevent them.

In addition, improved technologies could limit upset emissions. For example, refineries can recycle their gases with a vapor recovery system rather than flare them. Flares should only be used in true emergencies, not as a regular system for disposing of gases or “off-spec” product. Installing adequate compressor and

sulfur recovery unit capacity, and ensuring there are adequate back-up systems for these units, would likely significantly reduce upsets. Likewise, facilities should be required to have adequate back-up power supplies to prevent upsets during power outages. These back-up supplies should be fueled by clean fuels, not diesel.

Without adequate staffing, accidents are more likely. Refinery production and capacity has increased over the past ten years, while the number of people employed in the refining sector has declined.¹⁷ Employment numbers for the chemical industry have also declined.¹⁸ Facilities should ensure that they have adequate staffing to operate safely.

Finally, laws that require upset emissions to be included in pollution limits will force the development of technologies to better control these emissions. For example, Texas’ rules include a cap on total VOC emissions in the Houston/Galveston area. The current rules exempt upset emissions from the cap, but Texas has proposed new rules that would generally require upset emissions to be included in the cap.¹⁹ Requiring facilities in Houston and Galveston to count upsets against their VOC limits will likely spur creative solutions for preventing upsets.



Failure to Regulate Upset Pollution

Regulations and permit limits, no matter how stringent, cannot clear the air if sources continue to emit extra pollution through loopholes in the law. Loopholes, which grant facilities a free pass for excess emissions labeled as upsets, provide little incentive for industry to prevent upsets, and make it difficult for regulators to keep air pollution below harmful levels.

Clean Air Act Requirements

The federal Clean Air Act mandates continuous compliance with its pollution limits.²⁰ It does not provide general exceptions for excess pollution due to upsets, but instead requires that any exceedance of a federal air pollution limit be treated as a violation subject to enforcement.

The Clean Air Act requires states to adopt and enforce emission limits at least as stringent as those in federal and EPA

approved state rules.²¹ In addition, states must have the authority to collect penalties of at least \$10,000 per day for each violation of a federal air pollution limit.²²

Upset Loopholes

Despite the Clean Air Act's requirement for continuous compliance, EPA's rules and policy have created numerous loopholes that allow emissions during upsets to exceed pollution limits.²³ Three of the loopholes that can excuse or limit enforcement for excess emissions caused by upsets are discussed below.

Loopholes in Federal Emission Limits

The Clean Air Act requires EPA to set New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPS). NSPS applies to types of sources that EPA has determined "cause(s), or

contribute(s) significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare."²⁴ NESHAPs apply to certain categories of sources that emit air toxics that are known or suspected of causing cancer or other serious health effects.²⁵

EPA's NSPS and NESHAP rules include general exemptions for excess emissions caused by upsets. For example, while sources subject to a NESHAP must develop and comply with a plan to ensure operation "in a manner consistent with safety and good air pollution control practices for minimizing emissions" during upsets, they are generally exempt from the NESHAPs' emission limits during upsets.²⁶ The rules state:

The . . . standards set forth in this part shall apply at all times *except during periods of startup, shutdown, and malfunction*, and as otherwise specified in an applicable subpart.²⁷

Likewise, the NSPS rules generally provide that excess emissions during startup, shutdown and malfunction are not violations of the pollution limit, unless otherwise specified in a particular standard.²⁸

These rules apply to pollutants that Congress and EPA have determined can harm human health. EPA's exemption of these pollutants from compliance with emission limits during upsets does not "provide an ample margin of safety to protect public health" as required by the law.²⁹ EPA should review and revise its standards, taking into consideration the health impacts of pollution caused by upsets.³⁰

Loopholes in Federal Air Permits

Additional loopholes allow upset emissions to exceed limits in federal air permits. The Clean Air Act includes two basic permitting programs, New Source Review (NSR) and Title V.

NEW SOURCE REVIEW

NSR requires preconstruction permits for major new facilities and for emission-increasing changes at major facilities.

Whether or not a source is major is determined by the amount of pollution a facility has the potential to emit. EPA has clearly stated that regular startup, shutdown and maintenance emissions should be counted towards a facility's potential to emit and should be subject to permit limits.³¹ Despite this requirement, they often are not.

For example, Texas' rules include a provision allowing some startup, shutdown and maintenance emissions to be kept off-permit.³² Not counting these regular startup, shutdown and maintenance emissions in determining whether a facility is major may allow a facility to illegally avoid federal NSR permitting and associated requirements for: (1) good design and operation, including the use of best available control technologies, (2) studies of off-property impacts, including health impacts, and (3) reductions in pollution to "offset" any pollution increases.

Similarly, keeping regular startup, shutdown and maintenance emissions "off-permit" means that these emissions are not subject to pollution limits included in permits. EPA has approved an Alabama rule expressly exempting sources from compliance with permit limits during upsets. It states:

The Director may, in the Air Permit, exempt on a case by case basis any exceedances of emission limits which cannot reasonably be avoided, such as during periods of start-up, shut-down or load change.³³

The Clean Air Act requires facilities to obtain NSR permits to help keep pollution within safe levels and to ensure that new pollution control technologies continue to be developed. EPA should eliminate state SIP provisions that allow

upsets to evade NSR requirements and thwart these goals.

TITLE V

Title V of the Clean Air Act requires major sources to obtain operating permits that list all of the federal air pollution control requirements applicable to a facility. These applicable requirements include NSR permit terms, SIP requirements and federal regulations. The intent of the permit is to locate in one document all of a facility's applicable requirements and to assure compliance with those requirements.

EPA has included in its rules a provision that allows Title V permits to exempt excess emissions from compliance with technology-based limits if the source can show the emissions were caused by an "emergency."³⁴

Because the law does not allow EPA to create Title V permit terms that alter applicable requirements, this emergency provision is illegal. Title V permits are supposed to be a tool for ensuring compliance with Clean Air Act requirements, not for creating excuses for noncompliance. Furthermore, it is simply one more vaguely defined loophole on top of all of the other loopholes already included in applicable requirements.

Loopholes in State Implementation Plans

In addition to setting certain emission limits and overseeing state permitting programs, the Clean Air Act requires EPA to review and approve or disapprove State Implementation Plans (SIPs). SIPs are state-specific plans to bring state air pollution levels below federal health-based air quality standards, known as National Ambient Air Quality Standards, and to make sure they stay there. States are required to submit these plans, along with modeling demonstrating that they will work, to EPA for approval. The plans include permitting requirements and state emission limits.

EPA's policy is that states cannot adopt SIP rules that generally exempt upsets from compliance with legal limits because such rules would violate the Clean Air Act. There are several loopholes, however, through which EPA has allowed states to evade this general policy. Further, EPA has turned a blind eye while states have abused the loopholes and allowed far broader exemptions than EPA's policy allows. Three of these loopholes are discussed below.

FACILITY-SPECIFIC VARIANCES

States must prove that their SIPs will keep air pollution within legal limits. States are largely free, however, to choose the methods they will use to reduce pollution. A state can, therefore, ask EPA to amend its SIP as long as the state proves that, under the revised SIP, pollution will still meet legal limits.

Contrary to these requirements, EPA has allowed states to amend their SIPs without EPA approval by allowing states to grant facility-specific variances from compliance with SIP emission limits. The variances do not require a demonstration that, in light of the emissions authorized by the variance, the state SIP will still keep air pollution below legal limits. Nor is EPA approval required before the variance can take effect.

For example, the Louisiana SIP includes a variance provision that allows the state to exempt facilities from compliance with SIP and other requirements without EPA approval and without a demonstration that the SIP will continue to comply with Clean Air Act requirements. To qualify, a facility must simply show that compliance with a rule "would cause undue hardship, would be unreasonable, impractical or not feasible under the circumstances."³⁵ Louisiana frequently grants variances that exempt upset emissions from compliance with legal limits. Similarly, EPA has approved a California variance that allows the South Coast Air Quality Management

District to grant variances from federal requirements without individual EPA approval.³⁶

WAIVER OF PENALTIES

While EPA does not, theoretically, allow state SIP rules to exempt upsets from compliance, it has adopted a policy allowing state rules to immunize certain upset emissions from monetary penalties. In other words, while excess emissions are still violations of the law, states can adopt rules guaranteeing industry that it cannot be required to pay monetary penalties for certain excess emissions. EPA's Startup, Shutdown, Malfunction guidance, issued in 1983 and reaffirmed in 1999 and 2001, lays out conditions that states must require facilities to prove in order to qualify for this waiver of penalties.³⁷ These conditions are listed in Table 4.

State rules may not waive penalties for upset emissions in areas where a single source or small group of sources has the potential to cause an exceedance of health-based, ambient air quality standards and may not excuse violations of federally promulgated standards. In spite of these limits, EPA's guidance conflicts with the Clean Air Act requirement that states have the authority to recover penalties for each violation of federal standards.³⁸

Even more problematic than the guidance itself, however, is the fact that EPA has approved numerous SIP upset provisions that are far broader than those authorized by its own guidance. In 1999 EPA noted:

A recent review of SIPs suggests that several contain provisions that appear

TABLE 4: EPA'S STARTUP, SHUTDOWN & MALFUNCTION GUIDANCE REQUIREMENTS

For Malfunctions	For Startup and Shutdown
The excess emissions were caused by sudden, unavoidable breakdown of technology beyond the control of the owner/operator.	The periods of excess emissions were short and infrequent and could not have been prevented through careful planning and design.
The excess emissions did not stem from any activity or event that could have been foreseen and avoided, or planned for.	The excess emissions were not part of a recurring pattern indicative of inadequate design, operation or maintenance.
The excess emissions could not have been avoidable by better operation and maintenance practices.	If excess emissions were caused by an intentional diversion of control equipment, that diversion must have been unavoidable to prevent loss of life, personal injury, or severe property damage.
The excess emissions were minimized to the extent practicable using air pollution control equipment or processes consistent with good practices.	At all times, the facility must have been operated in a manner consistent with good practice for minimizing emissions.
Repairs were made in an expeditious fashion, including the use of off-shift labor and overtime.	The frequency and duration of operation in startup or shutdown mode must have been minimized to the extent practicable.
Emissions were minimized, both in terms of quantity of emissions and duration of the event, to the extent practicable.	All possible steps must have been taken to minimize the impact of the excess emissions on ambient air quality.
All possible steps were taken to minimize the impact of the excess emissions on ambient air quality.	All emission monitoring systems must have been kept in operation if at all possible.
All emissions monitoring systems were kept in operation if at all possible.	The owner/operator's actions during the period of excess emissions must have been documented by a properly signed, contemporaneous logs or other relevant evidence.
The owner/operator's response to the excess emissions was documented by properly signed, contemporaneous operating logs, or other relevant evidence.	The owner/operator properly and promptly notified the appropriate regulatory authority.
The excess emissions were not part of a recurring pattern indicative of inadequate design, operation or maintenance.	
The owner/operator properly and promptly notified the appropriate regulatory authority.	

to be inconsistent with this policy, either because they were inadvertently approved after EPA issued the 1982–1983 guidance or because they were part of the SIP at the time and have never been removed.³⁹

It has been five years since EPA's acknowledgement of this problem, yet many illegal provisions remain in state SIPs. Our review found at least 29 illegal state upset provisions in SIPs. See Appendix A. A detailed analysis of SIP upsets provisions in two California air districts, as well as Georgia, Louisiana, Ohio, Pennsylvania and Texas is included in Appendices B through G. Common flaws run through many of these SIP provisions, including the following:

- *The rules exempt upset emissions from compliance with pollution limits:* Over half of state SIPs allow some upset emissions to exceed air pollution limits by exempting the emissions from compliance with the federal law. This clearly violates EPA's guidance, which states "any provision that allows for an automatic exemption for excess emissions is prohibited."⁴⁰ According to the guidance, state SIPs may, at most, grant a waiver of penalties for excess upset emissions. The excess emissions remain a violation, and EPA, states and citizens must remain free to bring their own enforcement actions.
- *The rules apply to violations of health-based limits and federal standards:* Many SIP upset provisions apply broadly to exceedances caused by upsets, including exceedances of health-based limits and federal standards, such as federal permit limits. Very few

of the provisions reviewed expressly prohibit the defense or exemption from applying to federal based limits.

- *The rules apply to excess emissions caused by planned maintenance:* Maintenance is a regular part of doing business at an industrial facility, and excess emissions that occur during maintenance do not qualify for a defense.⁴¹ These emissions should be included in facility permits. Despite this, a number of the provisions reviewed excuse excess emissions during planned maintenance.

Based on our analysis, at least 50 percent of state SIPs include upset provisions violating both the Clean Air Act and EPA's guidance. These provisions often exempt upset emissions from compliance with pollution limits and allow industry to emit millions of pounds of additional pollution with impunity.

Conclusion

EPA has approved numerous loopholes that allow emissions during upsets to exceed otherwise applicable limits. These upsets create extra pollution for which there is a health, environmental, social and economic cost. Upsets are avoidable with better management practices. Facilities have little incentive, however, to invest in better management practices and pollution controls if there is no penalty for excess emissions resulting from upsets. EPA and states should remove all legal and regulatory provisions that provide general exemptions or defenses for upset emissions.

Failure to Monitor and Report Upset Pollution



The large number of loopholes in the law makes it difficult to track how much pollution is really being emitted during upsets. This problem is exacerbated by the fact that states do not require adequate monitoring or reporting of upset emissions. As a result, states do not have adequate and timely data about pollution levels and community members cannot get information about emissions that may be harmful to their health.

Monitoring

Like most air pollution, upset emissions are usually not monitored. Instead, facilities estimate the amount of pollution emitted during upsets. These estimates are often based on one-time tests conducted when a facility began operation (which may have been long ago), calculation methods developed by EPA, and/or manufacturer's specifications regarding the efficiency of a piece of equipment.

Upset emissions are significantly underestimated.⁴² The U.S. General Accounting Office, the U.S. House of Representatives Committee on Government Reform (Minority Staff, Special Investigations Division) and the EPA's Office of Inspector General have all concluded that EPA's calculation methods, called "emission factors," are unreliable and do not accurately predict emissions from a particular facility.⁴³ In addition, one-time tests are usually performed under ideal operating conditions and do not reflect true emission levels.

Studies from several states have shown that there is more VOC pollution in the air than there should be based on industry's reported VOC emissions.⁴⁴ The underreporting of upset emissions, particularly those from flares, cooling towers and leaks, is likely a part of this problem.⁴⁵

Existing monitoring technologies would improve the accuracy of upset emission estimates. For example, portable optical gas imaging devices have been

found to be effective at finding emissions from broken valves or pipes. Open-path UV monitors have been effective at measuring VOC emissions at refineries and chemical plants.⁴⁶

Several state and local pollution control districts have adopted improved monitoring requirements for flares. While not as reliable as direct monitoring, regulations in California's South Coast and Bay Area Air Quality Management Districts do require monitoring that is significantly more detailed than that required by other states. These rules include requirements for flow monitoring and, in the Bay Area, video monitoring of flares.⁴⁷

Industrial facilities should be required to use the best monitoring technologies available for monitoring upsets. Without such monitoring, it will be impossible to know the true magnitude of air pollution from these facilities and to adequately account for these emissions in clean air plans and local health studies.

Reporting

Given the magnitude of upset emissions, and their frequently toxic nature, it is important that affected communities have quick access to information regarding what is being emitted during upsets and what actions they may need to take to protect their health. We spent over six months gathering data on upset emissions from facilities in California, Louisiana, Ohio, Pennsylvania and Texas.

State Reporting

Louisiana and Texas have centralized excess emission reporting systems that allowed us to track excess emissions for particular facilities.

- **Texas:** We gathered data on 30 Texas facilities. Texas has the best system for

reporting upset emissions. Facilities must electronically report all excess emissions exceeding a reportable quantity to the Texas emission event database within 24 hours.⁴⁸ Those reports are made available to the public on the Texas Commission on Environmental Quality's website within days after the upset.⁴⁹ Any corrections or updates to the reports must be filed within two weeks and those corrections are reflected in the online database. Texas' database could be improved, however, by requiring reports of toxic emissions more rapidly, by including excess emissions below the reportable quantity in the online database when they are reported, and by allowing access to rolling annual totals of facility upset emissions. The Texas facilities included in our study released 45,394,557 pounds of excess pollution during upsets in 2003. Detailed information regarding Texas' upset laws, as well as facility-specific data, is included in Appendix G.

- **Louisiana:** We gathered data on seven Louisiana refineries and chemical plants. Louisiana requires the reporting of all excess emissions. While these reports were only available in hard copy, they were generally accessible in the file room. Additionally, most of the reports included the required quantification of emissions. It is impossible for us to determine whether facilities were accurately reporting all upsets. The Louisiana records, however, appeared complete enough for us to total facility upset emissions. During 2001 and 2002, the seven facilities studied collectively released an average of 18,017,046 pounds of pollution per year from upsets. Detailed information regarding Louisiana's upset laws and reports, as well as data on emissions from specific facilities, is included in Appendix D.

While state agency file room staff in California, Ohio and Pennsylvania were helpful, we were simply not able to obtain reliable data regarding the amount of excess pollution emitted by particular facilities in those states.

- **California:** We gathered data on eight California refineries, three in the Bay Area and five in Southern California. California has reporting systems for excess emissions, but reports that were available frequently did not quantify excess emissions. Some reports merely stated that pollution exceeded applicable limits and some included emission rates, rather than the total pollution releases. The Bay Area Air Quality Management District also withheld many reports that contained emission data because they were being reviewed by the legal division. It was, therefore, not possible to gain an accurate picture of upset emissions at California facilities. Detailed information regarding California's upsets laws, as well as data on the specific facilities included in our study, is in Appendix B.
- **Ohio:** We gathered data on ten Ohio refineries and chemical plants. Ohio does not have a central reporting system for excess emissions. The files we were able to obtain suggest that many facilities are simply not reporting upsets in Ohio. In addition, those facilities that did file upset reports often did not include the amount of pollution released due to the upsets. Approximately two-thirds of the reports failed to specifically quantify emissions. As a result, we were not able to tally upset emissions for Ohio facilities. Detailed information regarding Ohio's upset laws and reports, as well as a sample spreadsheet showing the lack of data available regarding upset emissions, is included in Appendix E.

- **Pennsylvania:** We gathered data on two Pennsylvania refineries. Pennsylvania does not have a central reporting system for upsets. Many of the upset reports reviewed did not quantify the amount of pollution released. In addition, many failed to include any emissions of certain pollutants. We were not, therefore, able to determine the amount of pollution emitted by the Pennsylvania facilities during upsets. Detailed information regarding Pennsylvania's upset laws and reports, and a sample spreadsheet showing the lack of data available, is included in Appendix F.

While most states have some sort of reporting system for upset emissions, as is required by EPA's Startup, Shutdown and Malfunction guidance, the reporting systems vary significantly in terms of what must be reported and how quickly it must be reported. See Appendix A.

Federal Reporting

In addition to state reporting rules, federal law requires that anyone who releases a hazardous substance in amounts exceeding certain thresholds must report the release to the National Response Center (NRC) and the Local Emergency Planning Committee.⁵⁰ The NRC then posts those reports to its publicly accessible website.⁵¹ The Clean Air Act also requires facilities to "promptly" notify the state or local permitting authority of all violations of federal air pollution standards.⁵² While these reporting requirements should result in reliable data regarding upset emissions, in reality, they do not.

Local Emergency Planning Committees sometimes take months to respond to requests for information, and often keep records of releases for only one year. The NRC database is extremely difficult to use and often contains information that is different from what is

included in state records for the same upset. For example, a search of the NRC website for releases at BASF Fina Petrochemical in Port Arthur, Texas, found that 20 releases, which appeared to be above the federal reporting threshold, were missing. These releases were reported to the state of Texas. In addition, at least five events reported in the NRC database included different information from that included in the reports filed to Texas for the same event.

Likewise, the Clean Air Act Title V requirement that deviations be reported promptly, while beneficial, does not specifically require facilities to report the amount of pollution caused by their violation of the law. Instead, facilities generally just report that they exceeded a permit or rule limit.

These problems with the federal and state reporting system prevent the public from obtaining accurate information regarding excess emissions, including emissions of hazardous pollutants. Due to problems with the federal online database, and to the lack of specificity in Title V reports regarding upset emissions, it is difficult to determine from federal

reports how much pollution is being released during upsets.

Conclusion

Improved monitoring and reporting of upsets would serve multiple purposes. States would be more confident in the emissions estimates reported by industry and would be better equipped to develop pollution reduction plans. The public, particularly communities near industrial facilities, would be able to determine quickly whether upsets—which they often see, hear and smell—are creating a health hazard or are merely a nuisance. Every state should require a centralized electronic reporting system, like Texas', for all excess emissions. Facilities should be required to report most excess emissions within 24 hours and all toxic emissions immediately. These reports should be made available to the public through a state agency website as soon as possible, at least within 72 hours. Facilities can file follow-up reports within two weeks to correct and supplement the initial reports as necessary.



Failure to Take Enforcement Action for Upset Emissions

Both EPA and states fail to take adequate enforcement action for upset emissions. In general, enforcement at the types of facilities responsible for large numbers of upsets has declined in recent years. Research by the Fort Worth Star Telegram found that Notices of Violation for refineries have fallen by 52% since 2001, while formal enforcement actions have fallen by 68%.⁵³

While budget shortfalls and changing political priorities are part of the reason for this drop, loopholes in the law make it more difficult to bring enforcement actions. Often, only the facility has the information necessary to determine whether or not its excess emissions meet the requirements for an upset defense. As a result, states frequently assume that exceedances reported as upsets qualify for a defense. Out of 7,520 total reported excess emission events in Texas for 2003, Texas issued only 165 notices of violation and only 30 notices of enforcement.⁵⁴

Many upset reports do not include enough data to explain the root causes of upset events. The abbreviated explanations that Texas and Louisiana companies are required to provide, however, demonstrate that companies are reporting excess emissions that do not qualify for a defense and should result in enforcement action. Many of these excess emissions fall into one of the three following categories: (1) emissions due to non-technological failures, (2) emissions due to foreseeable and preventable causes, and (3) maintenance emissions.

Non-technological Failures

EPA's guidance states that, to qualify for a defense, malfunctions must have been caused by "sudden, unavoidable breakdowns of technology, beyond the control of the owner or operator."⁵⁵

A number of the reports reviewed, however, document excessive emissions caused by human error or other non-

technological causes. At least eleven reports by Shell Chemical's Norco facility and three reports by Exxon Mobil Chemical's Baton Rouge facility specifically listed human error as the cause. Similarly, the SACROC CO₂ treatment plant in Texas reported releasing more than 100 tons of VOCs after defective product forced a shutdown of production. These events clearly do not qualify for a defense and should be subject to enforcement action.

Foreseeable/Preventable Causes

EPA's guidance provides that the excess emissions must not have stemmed "from any activity or event that could have been foreseen and avoided, or planned for."⁵⁶ This requirement set a very high bar that is not being enforced. In one instance, Motiva's Norco Refinery reported to Louisiana that its excess emissions were avoidable, yet the Louisiana Department of Environmental Quality's report on the July 21, 2002 upset states, "this release appears to be not preventable disregarding the facility's statement to the contrary. This release qualifies as an upset ... There are no areas of concern at this time."

In addition, a number of the reports cited causes for excess emissions that were clearly foreseeable or could have been prevented by better operational and maintenance practices. For example:

Power Outages: Power interruptions were one of the most frequently cited explanations for some of the worst upsets. Occasionally, these outages occurred due to loss of power from a source outside the plant. Other power interruptions involve voltage surges, or other malfunctions of electrical components within the plant. Outages due to storms and lightning strikes caused some of the most dramatic upsets. Table 6 identifies some of the larger emission events triggered by internal or external power failures.

Petrochemical plants today are largely computer controlled, and a loss of power can reverberate throughout the plant. Electrical storms, hurricanes and flooding are a fact of life, particularly on the Gulf Coast. These events are clearly foreseeable and excess emissions that result from them should not qualify for a defense.

Cooling Towers: Facilities identified leaks from cooling towers as the source of some of the largest excess emissions. Just three plants—Huntsman Chemical in Port Neches, BASF-Fina in Port Arthur, and BP's Texas City refinery—together released nearly 400 tons of VOCs from cooling towers in 2003 alone. Such emissions often include large amounts of carcinogens like benzene and butadiene.⁵⁷

An October 2003 report by the Galveston-Houston Association for Smog Prevention (GHASP) found that cooling towers at fourteen area plants

TABLE 6: POWER FAILURES

Facility	Cause	Emissions
Atofina Port Arthur	Power supply from Entergy cut off	90 tons SO ₂
Goldsmith Gas Plant	Blowout of voltage surge protector	70 tons SO ₂ and VOCs
BASF	Onsite electrical malfunction	14 tons benzene; 11 tons butadiene
Atofina Port Arthur	Lightening knocked out onsite power station	1,300 tons SO ₂
Boyd Compressor Station	Storm blew down power lines	800 tons SO ₂

leaked 1,300 excess tons of VOCs into the atmosphere every year, or about half the amount of annual VOCs these fourteen plants reported to the emissions inventory.⁵⁸ Our review of upset reports lends further support to GHASP's findings. Given the frequency of cooling tower leaks, their emissions are foreseeable and should not be excused as upsets.

Compressor Malfunctions: Compressor malfunctions are endemic at petrochemical and natural gas processing plants, and occurred repeatedly at some of the facilities studied. For example:

- The Wasson CO₂ removal plant in Yoakum County reported malfunctions at its #1 inlet compressor on at least ten different occasions in 2003 (June 12, July 7 and 30, August 9 and 11, November 1, 11, 16, and 21 and December 3);
- The Welch CO₂ plant reported five malfunctions at the U201 compressor in 2003 (February 2, March 12, September 5, September 20, and December 11);
- Valero's Corpus Christi Refinery (East plant) released nearly 200 tons of SO₂ as a result of repeated breakdowns of its vacuum jet compressor.

These and other repeated malfunctions of the same compressors may have different causes, but their frequency warrants further investigation.

Sulfur Recovery Units: Upset reports from Texas and Louisiana document numerous failures of sulfur recovery units. A breakdown at Exxon Mobil's Chalmette refinery, for example, triggered flaring that released nearly 200 tons of SO₂ in just a nine hour period. The Atofina refinery in Port Arthur dumped more than 300 tons of SO₂ after breakdowns at its sulfur recovery units in mid-June last year.

Petroleum refineries strip sulfur from refinery gases in order to meet federal limits on how much sulfur is allowed in gasoline. New "clean fuels" requirements will require additional sulfur to be removed from gasoline. This removed sulfur is sent to the end of the plant for recovery because it can sometimes be recycled as a feedstock for other products. Undersized or poorly maintained sulfur recovery systems can cause this sulfur to be released into the air in local communities.

Refineries should be required to have sulfur recovery units that are adequately sized and maintained to handle their workload. Excess emissions due to undersized or poorly maintained units should not be excused.

Maintenance Emissions

EPA's Startup, Shutdown and Malfunction guidance does not allow excess emissions from planned maintenance to qualify for a defense. Facilities must perform maintenance as a routine part of doing business. Emissions from maintenance should, therefore, be included in facility permits and should be subject to best available pollution controls. Texas and Louisiana plants, however, frequently report substantial excess emissions from maintenance activities. The emissions during these events were typically flared or even vented to the atmosphere in lieu of the more stringent pollution controls required during normal operations.

For example, during its "annual overhaul" of its number 22 compressor engine, Duke Energy's Goldsmith Gas plant in Ector County reported releasing nearly 1,000 tons of VOCs, or more than ten times the total the plant reported to the state's annual emission inventory. The Goldsmith plant reported another 1,800 tons of SO₂ as a result of an annual shutdown of its sulfur recovery plant

so the state could complete its annual inspection. The Sid Richardson Carbon plant in Hutchinson County reported 1,500 tons of CO through four separate maintenance events.

Likewise, the Wasson CO₂ plant routed gas to its flares while replacing worn out pipe, releasing more than 400 tons of SO₂ in the process. Natural gas and petrochemical plants are crisscrossed by miles of piping. Repair and maintenance of these pipes should be a normal, planned part of facility operations and any excess emissions resulting from

such maintenance should not qualify for a defense.⁵⁹

Sometimes, large amounts of pollutants are released because something goes wrong during maintenance. Citgo's Corpus Christi refinery released more than 180 tons of CO when its boiler overloaded during maintenance of a steam generator, while the Boyd Compressor station off-gassed 150 tons of VOCs after a breakdown occurred during repairs. These and similar events warrant a closer look to determine whether such accidents could have been avoided with greater care.

Conclusion and Recommendations



Pollution from upsets has been allowed to occur under the radar and largely without regulation or enforcement. The emissions that are slipping through loopholes in the law are significant and are contributing to adverse health effects in communities that are already overburdened by pollution. These extra emissions are not unavoidable. Better management practices and control technologies at industrial facilities would reduce upsets. EPA and states should eliminate legal loopholes and bring enforcement actions for upsets to provide facilities with incentives to make improvements. States should require better monitoring and electronic reporting to allow regulatory agencies and the public to track excess emissions.

Eliminate Loopholes

EPA should eliminate the “emergency” loophole in its own Title V regulations

and should carefully review its New Source Performance Standards and National Emission Standards for Hazardous Air Pollutants to limit upset exemptions and ensure that the standards for hazardous pollutants provide an ample margin of safety to protect public health. EPA should also remove from federally approved state air pollution plans all upset loopholes that go beyond recognizing agency enforcement discretion. EPA has known about illegal State Implementation Plan provisions for years, and its failure to act is inexcusable and clearly violates the Clean Air Act.

EPA and states should ensure that federal permits do not create additional loopholes for upset emissions. States should consider regular upset emissions when issuing permits. These emissions should be included in calculations of a facility’s potential to emit, which determines the applicability of many federal requirements. In addition, these emissions should be included in the modeling

used to ensure that new or expanded sources do not cause ambient air quality to exceed health-based levels. Finally, upsets should not be exempt from best available control technology requirements.

Improve Monitoring and Reporting

Real monitoring of upset emissions should be increased. In particular, improved monitoring is needed for flares, leaks and cooling towers. Better reporting of excess emissions is also needed. States should have a central, electronic reporting system for all excess emissions. States should require electronic reporting of all excess emissions within 24 hours, and toxic emissions should be reported immediately. These reports should be made available to the public on state agency websites within 72 hours. It is important that members of the public have quick access to information regarding the excess pollution to which they are being exposed. The reports should, at a minimum, specify:

- the individual pollutants emitted,
- the amount of each pollutant emitted,
- the method of calculating emissions,
- the cause of the emissions,
- the amount by which the emissions exceed regulatory limits,
- the regulatory limits that apply, and
- the actions planned to prevent such excess emissions from occurring in the future.⁶⁰

Increase Enforcement

Increased enforcement for upset emissions is necessary to provide incentives for facilities to reduce these emissions. Industry has little incentive to hire sufficient staff and perform preventive maintenance if it is cheaper to simply allow excess emissions. EPA and states should take the following steps:

- EPA should act on the Environmental Integrity Project's March 19, 2003 request for enforcement action for excess emissions in Port Arthur. EPA should also investigate and take enforcement action for excess emissions at other facilities documented in this report;
- States should allocate sufficient funding and enforcement staff to review upset reports and to take enforcement action for illegal excess emissions, particularly those that cause nuisance conditions and contribute to health threats;
- States should adopt automatic mandatory penalties for upset emissions. For example, a "three strikes" policy would allow the state to exercise enforcement discretion for the first two upset emissions in a year, but would require automatic penalties for subsequent upsets.⁶¹ Permits should also automatically require facilities to shut down if they exceed a certain number of upsets, or if pollution from their upsets exceeds a set amount. In addition, states should require facilities to offset their upset emissions by reducing routine emissions by at least an equal amount;
- Penalties, for all air violations, should be based on the amount and toxicity of the emissions. Under Clean Air Act Section 113(d), EPA is limited to assessing penalties of \$25,000, adjusted

for inflation, per day for each violation of the Clean Air Act. This means that a source that exceeds its emission limit by 100 pounds of toxic pollution may be liable for the same maximum penalty as a source that exceeds its limit by 1,000,000 pounds. Congress should amend the Clean Air Act to allow additional penalties based on the quantity of toxic or hazardous pollution emitted. A similar approach is authorized by section 311(b)(7) of the Clean Water Act for discharges to water of hazardous substances or oil.

Study Health Effects

There have been no comprehensive studies on the effects of upset emissions on the health of many refinery and chemical

communities. People from these communities tell the same stories regarding breathing difficulties, burning eyes, rashes, and high cancer and hysterectomy rates. Toxic upset emissions, added on top of the large number of toxics to which these communities are already exposed, are a likely culprit. EPA and states should prioritize funding studies on the long and short-term effects of toxic upset emissions on local communities. As a first step, they should fund and organize comprehensive health registries for cancer, birth defects, autoimmune diseases and asthma. These registries should be geographically targeted to the communities surrounding large industrial sources. These communities deserve to know what is being emitted into their air, as well as what effects those emissions may have on their health.

NOTES

- ¹ There is no uniform definition of "upset." In this report it is used broadly to cover excess emissions that are allowed to evade regulation and enforcement, and may include malfunctions or breakdowns, as well as some startups, shutdowns and maintenance activities.
- ² Facilities are required to report their total annual emissions of certain pollutants to states every year. These emission numbers are compiled into state "emission inventories" and are used for developing air pollution reduction plans and for assessing fees. Some states require upset emissions to be included in annual emission inventory reports and others do not. Emission fees are generally assessed by states based on the size of a facility's emissions as reported to the emission inventory. If upset emissions are not included in the inventory, therefore, they are often not assessed fees. In addition, many states have emission caps that require facilities to pay fees on only their first 4,000 tons of emissions. This means, even in states where upset emissions are reported in the annual inventory, large facilities with routine emissions over 4,000 tons do not have to pay fees on their upset emissions.
- ³ H.R. 4517, 108th Cong., 2d. Sess. (2004).
- ⁴ This includes only SO₂, NO_x, VOCs and H₂S. Other pollutants were not tallied.
- ⁵ Neither the upsets total, nor the Dallas total includes PM emissions.
- ⁶ Texas data show that these types of facilities were responsible for the majority of upsets emissions in Texas in 2003. Facilities in just five industrial classifications—industrial organic chemicals, natural gas liquids, crude petroleum and natural gas, carbon black and petroleum refining—were responsible for 94% of the 2003 upset emissions in Texas. Texas Commission on Environmental Quality, Annual Enforcement Report Fiscal Year 2003 (December 1, 2003).
- ⁷ In addition, upsets cause the formation of Products of Incomplete Combustion (PICs). PICs are hazardous air pollutants that are formed as artifacts of combustion, but are not present in the original waste stream. Dioxins and furans are the most commonly identified PICs. Emissions of dioxins and furans can rise up to 50 times during upsets in medical waste incinerators.
- ⁸ The total includes upset emissions of SO₂, H₂S, CO, NO_x, and VOCs. Upset emissions for Texas facilities are emissions reported from 1/31/03 to 1/31/04. Texas' online upset reporting system began tracking upsets on 1/31/03. Upset emissions for Louisiana facilities are the average of upsets reported to the state for 2001 and 2002.
- ⁹ Texas 2003 upsets were compared to Texas emission inventory data for 2002, the most current year for which data is available.
- ¹⁰ SACROC's 2003 upset emissions were six times the total emissions it reported to the emission inventory for 2001.
- ¹¹ For Texas facilities, 2003 upset data was gathered and compared to Texas 2002 emissions inventory data. For Louisiana facilities, 2001 and 2002 upset data was gathered and compared to Louisiana emission inventory data for 2001 and 2002.
- ¹² Citgo's Corpus Christi refinery is not included on this list because we gathered upset data for only the East Plant, while available production capacity was for the East and West plants together. Capacity data are as of 1/31/03.
- ¹³ 2002 totals are as reported on the EPA Toxics Release Inventory.
- ¹⁴ EPA "National Air Toxics Assessment" at <http://www.epa.gov/ttn/atw/nata/risksum.html>. See also, California Environmental Protection Agency, "Toxicity Criteria Database—OEHHA Cancer Potency Values" (Office of Environmental Health Hazard Assessment, December 2002).
- ¹⁵ See, "The Silent Treatment," Natural Resource Defense Council's One Earth (Spring 2002).
- ¹⁶ Memorandum re: Summary of Significant Events from March 1, 2000 through December 31, 2000 for the Gulf Coast Upset Maintenance Pilot Project from Michael Freer, Air Liaison, Gulf Coast Upset/Maintenance Coordinator, to Texas Natural Resource Conservation Commission Commissioners (Jan. 10, 2001).
- ¹⁷ U.S. Dept. of Labor, Bureau of Labor Statistics. <http://www.data.bls.gov>. From 1994 to 2003, the total number of employees in petroleum refining declined by approximately 21%.

- ¹⁸ U.S. Dept. of Labor, Bureau of Labor Statistics. <http://www.data.bls.gov>. From 1994 to 2003, the total number of employees in chemical manufacturing declined by approximately 30%.
- ¹⁹ 30 Tex. Admin. Code, Chapter 115, Subchapter H.
- ²⁰ Clean Air Act §302(k).
- ²¹ Clean Air Act §116.
- ²² Clean Air Act §502(b)(5)(E).
- ²³ The theory behind these defenses is that, for some pollution limits, the stringency of the limit is based on a determination of what is technologically feasible, rather than what is needed to achieve certain air quality goals. Because technologies sometimes fail, due to no fault of a facility, EPA believes some defenses are warranted. EPA has not been consistent, however, in defining what is a technology-based limit versus what is an air quality-based limit. Likewise, EPA has not limited approved defenses to technology-based standards. See, for example, 61 Fed. Reg. 64463, 64470 (Dec. 5, 1996) and 60 Fed. Reg. 45530, 45558-45561 (Aug. 31, 1995). In addition, EPA's theory fails to consider the impacts of pollution on public health, regardless the culpability of the facility emitting the pollution. For example, drivers must pay for the damage they cause others in a car accident even if the accident was caused by a failure of technology beyond their control, such as brake failure.
- ²⁴ Clean Air Act §111(b).
- ²⁵ Clean Air Act §112(b)(2).
- ²⁶ 40 C.F.R. §63.6(e).
- ²⁷ 40 C.F.R. §63.6(f) (emphasis added).
- ²⁸ 40 C.F.R. §60.8(c).
- ²⁹ Clean Air Act §112 (f)(2).
- ³⁰ The CAA requires EPA to review its NESHAP standards within eight years after promulgation to ensure that they provide an "ample margin of safety to protect public health." If the standards do not reduce the lifetime excess cancer risks to the individuals most exposed to cancer-causing emissions from regulated facilities to less than one in one million, the standards must be revised. Clean Air Act §112(f)(2). EPA should clearly consider exposure to upset emissions when making these cancer risk determinations.
- ³¹ See example, Letter from David Neleigh, EPA Region 6 Chief Air Permits, to John Steib, Texas Commission on Environmental Quality Director Air Permits Division (May 1, 2002).
- ³² 30 Tex. Admin. Code §§ 101.222(c) & (e).
- ³³ Alabama SIP section 335.3.14-.03(1)(h).
- ³⁴ 40 C.F.R. §70.6(g)(2).
- ³⁵ 33 LAC III.917.
- ³⁶ SCAQMD Rule 518.2. These Louisiana and California rules are discussed in more detail in Appendices B and D.
- ³⁷ U.S. EPA Memorandum, "State Implementation Plans: Policy Regarding Excess Emissions During Malfunctions, Startup and Shutdown," (Sept. 20, 1999).
- ³⁸ Clean Air Act §502(b)(5)(E). In addition, EPA has allowed state affirmative defense provisions to apply to citizen suit actions for penalties under the Clean Air Act. EPA has, therefore, added additional requirements to what a citizen must prove to prevail in a citizen suit. This violates Clean Air Act §304.
- ³⁹ U.S. EPA Memorandum, "State Implementation Plans: Policy Regarding Excess Emissions During Malfunctions, Startup and Shutdown," (Sept. 20, 1999); A study by EPA Region 9 found similar problems. Memorandum from Nadia Wetzler to Ginger Vagenas "Excess Emission Provisions" (Sept. 26, 2000).
- ⁴⁰ EPA Guidance at Attachment p. 1.
- ⁴¹ Letter from Jeffrey Holmstead, EPA Assistant Administrator Office of Air and Radiation and John Suarez, EPA Assistant Administrator Office of Enforcement and Compliance Assistance to Eric Schaeffer (Oct. 28, 2003).
- ⁴² This is true for normal air emissions as well because those emission estimates are based largely on calculations.
- ⁴³ United States General Accounting Office, "Air Pollution: EPA Should Improve Oversight of Emissions Reporting by Large Facilities (GAO-01-46, April 2001); U.S. House of Representatives, Minority Staff, Special Investigations Division, Committee on Government Reform, "Oil Refineries Fail to Report Millions of Pounds of Harmful Emissions" (Prepared for Rep. Henry A. Waxman, November 10, 1999); United States Environmental Protection Agency, Office of Inspector General, "EPA's Method for Calculating Air Toxics Emissions for Reporting Results Needs Improvement" (Report No. 2004-P-00012, March 31, 2004)
- ⁴⁴ Bay Area Air Quality Management District, "Technical Assessment Document: Further Study Measure 8, Flares" (Draft Revision 2, December 2002), "Technical Assessment Document: Further Study Measure 8, Pressure Relief Devices" (Draft Revision 2, December 2002), and "Proposed Regulation 12, Rule 11: Flare Monitoring at Petroleum Refineries" (Draft Staff Report, March 2003); Katzenstein, Doezeema, Simpson, Blake and Rowland, "Extensive Regional Atmospheric Hydrocarbon

- Pollution in the Southwestern United States" (August 2003) and Mid-Atlantic Regional Air Management Association, "Evaluating Petroleum Industry VOC Emissions in Delaware, New Jersey and Southeastern Pennsylvania" (October 2003).
- ⁴⁵ Environ International, "Measurement and Assessment of Equipment Leak Fugitives and Vent Emissions in Industrial Ethylene and Other Chemical Sources" (Texas Environmental Research Consortium, June 2003); U.S. House of Representatives, Minority Staff, Special Investigations Division, Committee on Government Reform, "Oil Refineries Fail to Report Millions of Pounds of Harmful Emissions" (Prepared for Rep. Henry A. Waxman, November 10, 1999) (estimating that leaking components at refineries released an average of 40,000 tons more VOC's to the atmosphere than reported in EPA's official emissions inventory); Galveston-Houston Association for Smog Prevention, "Smoke in the Water: Air Pollution Hidden in the Water Vapor from Cooling Towers—Agencies Fail to Enforce Against Polluters" (February 2004).
- ⁴⁶ The Institute of Clean Air Companies website at <http://www.icac.com/welcome.html> provides useful information about available monitoring (and control) technologies.
- ⁴⁷ SCAQMD Rule 1118 & BAAQMD Reg. 12-11-500.
- ⁴⁸ 30 Tex. Admin. Code §101.201(g).
- ⁴⁹ <http://www.tnrc.state.tx.us/enforcement/fod/eer/>.
- ⁵⁰ Comprehensive Environmental Response, Compensation, and Liability Act §103(a); Emergency Planning and Community Right to Know Act §304(b).
- ⁵¹ <http://www.nrc.uscg.mil/foia.html>.
- ⁵² Clean Air Act §503(b)(2). EPA used to interpret "promptly" as within two to seven days. EPA now interprets "promptly" as within six months.
- ⁵³ Jeff Claassen, Scott Streater & Seth Borenstein, *Is the EPA Doing Enough?*, Fort Worth Star-Telegram, July 18, 2004, at 1A.
- ⁵⁴ Texas Commission on Environmental Quality, Annual Enforcement Report Fiscal Year 2003 (Dec. 1, 2003); <http://www.tnrc.state.tx.us/enforcement/AER>.
- ⁵⁵ EPA Guidance at Attachment p. 4.
- ⁵⁶ *Id.*
- ⁵⁷ Even with these large numbers, it appears that cooling tower leaks may be under-reported. The reports reviewed reveal that upon discovering cooling tower leaks, some plants work backward to try to determine when the leak first occurred, then estimate all emissions from the start of the leak to its final repair. Other plants, however, seem to calculate emissions from the date the leak is discovered, which would likely substantially underestimate actual releases.
- ⁵⁸ Galveston-Houston Association for Smog Prevention, "Smoke in the Water: Air Pollution Hidden in the Water Vapor from Cooling Towers—Agencies Fail to Enforce Against Polluters" (February 2004).
- ⁵⁹ Excess emissions from leaking valves and flanges may be systematically underreported. Some companies appear to believe that extra pollution from valves and flanges is allowed if those valves and flanges are covered by the federal Leak Detection and Repair (LDAR) program. For example, Huntsman Port Neches withdrew one of its upset reports stating the excess emissions did not have to be reported because they were from a valve covered by LDAR. LDAR does not, however, authorize excess emissions. As its name suggests, it requires only that components be repaired within a certain amount of time after a leak is discovered.
- ⁶⁰ These are all required in the electronic reports that must be filed in Texas following an upset.
- ⁶¹ States should clearly take enforcement action for all upsets that create a threat to public health or a nuisance.

APPENDIX A

50-State SIP Upset Rule Summary

State	Are some upset emissions allowed to exceed permit/rule limits? ¹	Type of rule ²	SIP rule ³	Are upset emissions included in the emissions inventory? ⁴	Are fees charged on upset emissions?	How quickly must upsets be reported?
AL	Yes	Variances; Exemptions in permits	ADEM. Admin. Code R. 335-3-1-.09; 335-3-14.03(1)(h)(1) & (2)	No	No	Maintenance – 24 hrs. prior; Malfunctions – w/ in 24 hrs.
AK	Yes	Affirmative Defense/ Exemption (rule not clear)	18 AAC 50.240	No	No	Within 2 days for unavoidable emergencies and malfunctions; 30 days after end of month incident occurred for other excess emissions, but ASAP if potential threat to human health
AZ	No	Affirmative Defense	A.A.C. R18-2-310	Sometimes	Yes, if included in inventory	24 hours w/ 72 hour follow up
AR	No	Enforcement Discretion	AR Reg 19, sec. 19.601 & 19.602	No	No	By end of next business day
CA		See Appendix B				
CO	Yes	Exemption	COLO. CODE REGS. Rule 1.G; Rule 2 II.E.			No later than 2 hours after the start of the next working day; followed by written notice
CT	Yes	Variances	CT 19-508-7; 19-508-13			Any shutdown of control equipment which may last more than 72 hours and during which the source will be operated must be reported “promptly”
DE	No	Enforcement Discretion	7 Del. C., sec. 6028 (reporting)	Yes	No	Immediately w/ written follow up in 30 days
DC	Yes	Variance	DC 8-2:724			
FL	Yes	Exemption	FAC 62-210.700; 62-4.130			Immediately for breakdowns
GA	Yes	Exemption	EPD Rule 391-3-1.02(2)(a)(7)	Yes	Yes	7 days for breakdowns causing excess emission for 4 hrs or more from a major source
HI	No	Enforcement Discretion	DOH Rule 11-60-16 (reporting)			24-hrs prior to maintenance; “immediately” for breakdowns
ID	No	Enforcement Discretion	IAC 58.01.01.130 – .136	Yes	Yes	2 hours before maintenance and 24 hours after breakdown w/ 15 day follow up
IL	Yes	Exemption	IAC 201.261 - .265	Yes	Yes (for Title V sources)	Immediately for malfunction or breakdown where source continues to operate
IN	Yes	Exemption	326 IAC 1-6-4; 326 IAC 1-6-2			Within 4 daytime, business hours for excess emissions lasting more than one hour
IA	Yes	Exemption	IAC 24.1 (455B); 445B.143	Yes (for Title V sources)	Yes (for Title V sources)	For excess emissions that are not the result of startup, shutdown or cleaning, within 8 hours of, or at the start of the first working day following the event; written follow up within 7 days

State	Are some upset emissions allowed to exceed permit/rule limits? ¹	Type of rule ²	SIP rule ³	Are upset emissions included in the emissions inventory? ⁴	Are fees charged on upset emissions?	How quickly must upsets be reported?
KS	Yes	Exemption	KAQR 28-19-11			Within 10 days for breakdowns; Prior approval for scheduled maintenance
KY	Yes	Exemption	401 KAR 50:055	No	No	3 days prior for planned shutdown; "as promptly as possible" for malfunctions or unplanned shutdowns or start-ups
LA	Yes	Exemption	33 LAC § 917	Yes	Yes	Within 1 hour for emergency conditions; w/in 24 hours for non-emergency conditions over the reportable quantity
ME	No	Affirmative Defense	SIP 101(4)	No	No	Within 48 hours; written report quarterly
MD	No	Enforcement Discretion	COMAR 26.11.01.07			Report onset of any excess emissions expected to last more than 1 hour; written report within 10 days of request by Department
MA	No	Enforcement Discretion				Most permits require w/in 3 days
MI	No	Enforcement Discretion (malfunction, startup, shutdown); Affirmative Defense (startup, shutdown)	R. 336.1912, 1915 & 1916	Sometimes	Sometimes	Notify of breakdown lasting more than 1 hour (if toxic or hazardous emissions) or 2 hours (if other emissions) "as soon as is reasonably possible" with written report in 10 days
MN		Enforcement Discretion	Minn. R. 7019.1000 (reporting)	Yes	Yes	24 hours prior to shutdown; immediately for emissions which endanger human health or environment; w/in 24 hours of breakdowns lasting more than one hour
MS	Yes	Exemption	APC-S-1 Section 10			Within 5 working days
MO	No	Enforcement Discretion	10 CSR 10-6.050	Yes	Yes	2 business days after malfunction emissions lasting more than 1 hour; 10 days prior to maintenance, startup or shutdown emissions lasting more than 1 hour. Written follow up in 15 days
MT	No	Enforcement Discretion	ARM 17.8.110	No	No	"Promptly" of malfunctions causing excess emissions or lasting more the 4 hours; written report w/in 1 week
ND	Yes	Exemption up to 10 days (may be extended)	NDCC 33-15-01-13	Yes (generally)	Yes (generally)	24 hours prior to planned shutdown; immediate notification of malfunction that threatens health or welfare; notification "as soon as possible" of other malfunctions lasting more than 24 hours.
NE	No	Enforcement Discretion	Title 129, Chap. 35, 001 - 008	Yes	Yes	10 days prior to planned startup or shutdown; w/in 48 hours of malfunction or unplanned startup or shutdown; written report w/in 15 days of request
NV	Yes	Exemption	Article 2.5.4 ⁵	Sometimes	Sometimes	Within 24 hours with written report in 15 days
NH	Yes	Exemption for up to 48 hrs for malfunction (may be extended)	Part ENV-A 902.03	Yes	Sometimes	Within 8 hours

State	Are some upset emissions allowed to exceed permit/rule limits? ¹	Type of rule ²	SIP rule ³	Are upset emissions included in the emissions inventory? ⁴	Are fees charged on upset emissions?	How quickly must upsets be reported?
NJ	No	Affirmative Defense (not clear whether just applies to penalties)	NJAC 7:27-22.16(l) ⁶			By 5 pm of the 2nd full calendar day
NM	Yes	Exemption	20 NMAC 2.7.100-109	Yes	No	24 hours prior to scheduled maintenance; 24 hours after the start of the next business day for malfunction, startup or shutdown, followed by written notification within 10 days after the start of the next business day (some notice may be waived)
NY	Yes	Exemption	Sec. 201.5			Reports of maintenance or startup if requested; Reports of malfunctions w/in 72 hours with written report w/in 30 days if requested
NC	Yes	Exemption	Reg. 2D.0535			Within 24 hours of excess emissions which last for more than 4 hours
OH	Yes	Variance (but see Appendix E)	SIP 3745-15-06	No	No	"Immediate" notice of malfunction; if event lasts longer than 72 hrs, must follow up with written report. Notice and request to operate during maintenance at least 2 weeks prior to planned maintenance
OK	Yes	Exemption	OK 252:100-9-3			Notice prior to proposed startup/shutdown; notice by next working day for malfunction
OR	No	Enforcement Discretion	Rules 340-028-1400 & 340-028-1430	Yes	Sometimes	Immediately for upsets at large sources
PA	No	Enforcement Discretion		Yes	Yes	According to permit provisions
RI	Yes	Variance	APCR 16	Sometimes	Sometimes	Depends on permit
SC	No	Enforcement Discretion				Within 24 hours, written report in 30 days
SD	No	Enforcement Discretion				Depends on permit
TN	No	Enforcement Discretion (rule unclear)	Chap. 1200-3-20			Within 24 hours of most malfunctions; 24 hours prior to most planned shutdown
TX	Yes	Exemption (Startup, Shutdown, Maintenance); Affirmative defense (malfunctions)	30 TAC 101.222(a) – (f)			Within 24 hours for emissions exceeding reportable quantity; follow up within 2 weeks
UT	Yes	Exemption for breakdowns	UAC R307-1-4.07			Within 3 hours "if reasonable" but at least within 18 hours for breakdowns lasting more than 2 hours
VT	No	Enforcement Discretion				As required

State	Are some upset emissions allowed to exceed permit/rule limits? ¹	Type of rule ²	SIP rule ³	Are upset emissions included in the emissions inventory? ⁴	Are fees charged on upset emissions?	How quickly must upsets be reported?
VA	Yes	Variance	9 VAC 5-20-180; VR 120-02-05A	Maybe	Yes	Within 4 daytime business hours for malfunctions causing excess emissions for more than 1 hour; Within 24 hours prior to planned shutdown resulting in excess emissions for more than 1 hour
VI	No	Enforcement Discretion	Section 204-29			Within 4 business hours; Written report within 1 week
WA	Yes (not clear)	Exemption (not clear)	WAC 173-400-107			If threat to human health or safety or unavoidable, report as soon as possible. Others reported within 30 days after end of month
WV	Yes	Variance	Rules 45-3-7, 45-5-13, 45-6-8, 45-7-9 and 47-10-9			Application for variance w/in 24 hours
WI	No	Enforcement Discretion				Immediate notice of hazardous substance air spills; 8 hours for other malfunctions; prior notice of scheduled maintenance, startup or shutdown
WY	Yes	Exemption	Chapter 1, Section 19			Within 24 hours

NOTES

¹ In addition to rules noted here, many states have Title V emergency provisions which allow certain upset emissions to exceed pollution limits.

² The interpretation of the provisions included in the chart is not necessarily the interpretation given by the states. In some cases, the regulations are vague and should be clarified. As used in the table:

- "Variance/Exemption" means the state can exempt facilities from compliance with clean air requirements, rather than merely waiving penalties (the rule may still require the facility to prove that certain conditions are met, as in an affirmative defense). Variances were not included if they require individual EPA approval. While exemption or variance rules may allow upset emissions to exceed permit/rule limits, we did not research how frequently these rules have been used in such a manner.
- Affirmative Defense means the rule grants a waiver of penalties if certain conditions are proven by source. The excess emissions still, however, constitute a violation.

- Enforcement Discretion means the state or local agency may choose which excesses to take enforcement action for, but none are excused from compliance or from penalties.

³ The information regarding current SIP upset provision was generally obtained from EPA Regional SIP webpages. The provisions in the approved SIP may vary from those in the states' current regulations. Additional information was provided by state environmental agency staff.

⁴ The information regarding whether upset emissions are included in the inventory and are charged fees was provided by states in response to a survey. If a state did not answer the survey, or did not answer this question on the survey, no information is included in these columns.

⁵ Nevada's SIP is not available online. EPA provided information regarding Nevada's SIP.

⁶ This rule does not appear to be in NJ's SIP, but is part of its Title V program.

APPENDIX B

California Upset Rules and Data

California is divided into 35 local air districts, which each have their own air pollution control rules. Details regarding the upset reporting and variance requirements for the South Coast Air Quality Management District (SCAQMD) and the Bay Area Air Quality Management District (BAAQMD) are discussed below. In addition to the problems with certain California rules discussed below, a recent report by the Environmental Working Group found lax enforcement by California's air pollution control districts and average penalties that are too low to deter noncompliance.¹

Bay Area Air Quality Management District

Upset Rules: The Bay Area Air Quality Management District's SIP approved upset rules appear to be consistent with the Clean Air Act and EPA's guidance. BAAQMD does, however, grant state variances. While these variances are not approved into the SIP, they can be used to exempt upset emissions from state enforcement.

- **Breakdown rules:** BAAQMD's SIP approved rules recognize the district's enforcement discretion with respect to excess emissions resulting from "breakdowns."² A breakdown is defined as an "unforeseeable failure or malfunction of any air pollution control equipment or operating equipment which causes a violation of any emission standard or limitation."³ Breakdowns do not include incidents resulting from "intent, neglect, or disregard" of the law or improper maintenance, or incidents that cause a nuisance or are an "excessively recurrent" breakdown of the same equip-

ment.⁴ The breakdown rule provides that BAAQMD "may refrain from" taking enforcement action for violations of emission standards resulting from a breakdown provided the emissions do not interfere with attainment or maintenance of the federal national ambient air quality standards.⁵ Only emissions occurring within 24 hours of the breakdown qualify under the breakdown provision.⁶

- **Variance Rules:** For breakdown emissions lasting longer than 24 hours, or for excess emissions caused by other factors, facilities can apply to the BAAQMD Hearing Board for a variance.⁷ If a variance is granted, it temporarily relieves the source from the obligation of complying with a district regulation or permit condition. BAAQMD's variance provisions are not included in the SIP, and cannot immunize emissions that exceed federal air pollution limits from EPA or citizen enforcement. Despite this, BAAQMD's granting of variances appears to

Henry Clark, Richmond, CA

I live on the front line of the chemical assault from the Chevron-Texaco Refinery in Richmond, California. The daily toxic emissions that my community is bombarded with are dangerous and deadly, the dioxins, benzene and xylene emissions. When there is an upset or explosion we have been exposed to toxics emissions for over a week. There is a high rate of childhood asthma and cancer in the Richmond, CA, area. This situation must stop! Chevron-Texaco must be held accountable to operate safely and compensate the community for years and years of chemical assaults.

violate the Clean Air Act requirement that states enforce emission standards at least as stringent as those in the SIP.⁸ BAAQMD's variance procedures and the state statute authorizing them should, therefore, be revised to provide that the process is simply an exercise of the agency's enforcement discretion and that all exceedances of emission limits are violations of the law subject to enforcement.

Reporting: BAAQMD does not have a general rule that requires facilities to report excess emissions. Its breakdown and variance reports should identify some of these emissions. In addition, BAAQMD's new flare monitoring rules and pressure relief device rules require the reporting of all emissions, routine and upset, from certain types of equipment.

- *Breakdown Reports:* Sources seeking breakdown relief must notify BAAQMD "immediately" following a breakdown.⁹ The notification must include the location, equipment involved and, to the extent known, the cause of the breakdown. A written follow-up report must be filed within 30 days that includes sufficient information for the agency to determine whether the cause of the emissions was truly a breakdown, a summary of corrective action taken and a summary of actions taken to ensure such breakdowns will not occur in the future.¹⁰ The rules do not require the reports to identify the type and quantity of emissions released, although agency guidance does.
- *Variance Files:* Applications to the Hearing Board for variances must include "to the extent possible" the number and type of emission points and measurements or estimates of the quantity and nature of emissions released during the event for which a variance is sought, as well as the quality in excess of legal limits.¹¹
- *Flare Monitoring Reports:* BAAQMD's flare monitoring rule requires monthly reports which specify the methane, non-methane and sulfur dioxide emissions, both upset and routine, from flares.¹²
- *Pressure Relief Device Reports:* BAAQMD's pressure relief device rules apply to refineries and chemical plants and require reporting of all releases greater than 10 pounds from pressure relief devices.¹³ These reports must include the amount of total organic compounds, ammonia, hydrogen sulfide, chlorine, sulfur dioxide, sulfur trioxide, hydrofluoric acid, and difluoroethane released.

While these reports each provide some information about certain types of upset emissions, without a centralized reporting system for all excess emissions that includes specific estimates of quantities, it was extremely difficult to determine how much excess pollution the facilities studied were emitting.

BAAQMD staff informed us that episode reports were the best place to look for upset emission data. Episode Printouts summarize all of the reported excess emission events at a particular facility. Individual Episode Reports include such useful information at the date and time of the event, the units involved, and whether a Notice of Violation was issued, but often fail to include the amount of pollution emitted during an event. Instead, the reports frequently simply site the regulatory limit and indicate that the facility exceeded that limit.

A further problem with the BAAQMD's system was the number of episode reports that were lost, on corrupted electronic media, or withheld by the legal department pending settlement.

BAAQMD would not produce information within numerous reports that were "withheld by legal." The emission data within the withheld documents is clearly public information under the Clean Air

Company	Reports Lost	Reports Withheld by Legal	Reports Corrupted
Shell Oil Refinery		17	
Tesoro Oil Refinery	8	11	1
Valero Oil Refinery		28	6

Act and should not be withheld for any length of time.¹⁴ Further, the emissions reports requested were from 2001 and 2002. It is unreasonable for the District to withhold even the non-emission information in these reports for this extended period of time.¹⁵

The District does post incident reports that it deems of significant interest to the public on its website.¹⁶ A limited number of reports are posted, however, and the reports often do not include information regarding the type or amount of pollution emitted. The reports do, though, include helpful information such as the number of complaints received during the event and the actions taken in response by BAAQMD.

Data: The attached spreadsheets include upsets documented in BAAQMD's episode report database for the following facilities:

Facility Name	Facility Location
Tesoro	Martinez, CA
Valero	Benicia, CA
Shell	Martinez, CA

Because BAAQMD does not have a uniform system for reporting quantities of excess emissions, and because so many of the reports were missing entirely or lacking emission data, it was impossible to determine how much pollution the facilities studied emitted during upsets. As can be seen from the attached Tesoro, Valero and Shell spreadsheets, the facilities frequently reported "break-

downs" but did not indicate the total amount of pollution released during the upset.¹⁷ Due to this lack of data, we did not attempt to total these facilities' upset emissions.

Our findings regarding the causes of upsets at Texas and Louisiana facilities, however, are consistent with a report by Communities for a Better Environment that found repeated Bay Area refinery flaring due to routine and preventable conditions, including equipment breakdowns, power failures and lack of compressor capacity.¹⁸

South Coast Air Quality Management District

Upset Rules: The South Coast Air Quality Management District's SIP includes upset provisions that violate the Clean Air Act and EPA guidance. SCAQMD's breakdown rules exempt certain upset emissions from compliance with emission limits and have not been approved into the SIP. SCAQMD's variance rule, however, referred to as the Alternative Operating Condition (AOC) rule, has been approved into the SIP despite its violating federal law.

- **Breakdowns:** SCAQMD's breakdown provision makes certain air pollution control rules "inapplicable to a violation directly caused by a breakdown" providing certain criteria are met.¹⁹

Cynthia Babich, Los Angeles, CA

“Choke, choke, gasp, gasp, these upset emissions, which are unreported and unpermitted, gas our community constantly. When we reviewed their Title V permits last year, we found that Exxon Mobil had operated without their electrostatic precipitator working properly for months and that tons of catalyst had been blown out of the catalytic cracking unit into the community. Something needs to be done!”

To qualify for the exemption, a source must demonstrate the following: (1) reporting requirements were met, (2) the breakdown was not caused by operator error, neglect, or improper operation or maintenance procedures, (3) steps were immediately taken to correct the conditions leading to the breakdown and emissions were mitigated to the maximum extent feasible, and (4) the equipment in violation was shut down within 24 hours or at the end of the operating cycle, whichever occurs first.²⁰ As noted above, this rule had not been approved by EPA into the SCAQMD SIP and cannot apply to prevent EPA or citizen enforcement for violations of federal emission standards. It still, however, appears to violate the Clean Air Act requirement that states enforce emission limits at least as stringent as those in the state SIP, as well as the requirement that states have the authority to collect penalties for every violation of the Act.²¹

- *Variances:* The SCAQMD's Hearing Board grants several different types of variances. These include emergency variances, regular variances, and "alternative operating conditions." If the Hearing Board grants a variance, a source is authorized to continue operating in violation of the law.

Rule 517 allows emergency variances for excess emissions lasting less than 24 hours caused by breakdowns. Rule 517 is not approved into the SCAQMD SIP. Variances granted pursuant to rule 517 that authorize violations of federal rules or SIP standards, however, appear to violate Clean Air Act section 116.²²

Rule 518.2 creates an exemption process that allows major sources to exceed their emission limits by changing those limits in their Title V permits. This exemption process is illegal,

but has been approved by EPA into the SCAQMD SIP. The AOC variance is included in SCAQMD's Title V rules and allows facilities to illegally change applicable requirements through their Title V permits. The AOC provision violates numerous requirements of the Clean Air Act and EPA guidance, including the following:

- Clean Air Act (CAA) §502 because Title V permits are not allowed to revise applicable requirements;²³
- CAA §110 because any revisions to the SIP must be approved by EPA and the AOC provision allows revisions to take effect if EPA takes no action;
- CAA §116 because, by granting any variance from SIP limits or other federal standards, SCAQMD is not enforcing emission limits at least as stringent as those in the SIP and federal regulations; and
- EPA's Guidance because the AOC can excuse violations that are not caused by unforeseen or unavoidable circumstances and creates an exemption, rather than an affirmative defense, that applies to both penalties and injunctive relief.

To date, apparently only one facility has applied to SCAQMD for an AOC, and that application is still pending. While the AOC does provide some protections not included in other exemption provisions—such as the requirement for obtaining emission reduction credits or mitigation—it is still an illegal exemption from federal Clean Air Act requirements and should be removed from the SCAQMD SIP.

Reporting: There is no uniform system for reporting excess emissions in SCAQMD. Like BAAQMD, SCAQMD has several reporting requirements that may include some information on upset emissions.

- *Breakdowns:* Facility operators must report breakdowns within one hour of the time they should have known about the violation caused by the breakdown.²⁴ The initial report must include the time, location, equipment, responsible party, and, to the extent known, the cause and estimated time for repairs.²⁵ Within seven days after the breakdown has been corrected, and no later than 30-days after the breakdown, the operator must file a written report, which includes the equipment causing the breakdown; the duration; the date of correction and demonstration of compliance; the identification of the times of emissions, quantification of emissions and basis used to quantify; information demonstrating that the breakdown was not the result of operator error, neglect, or improper operation or maintenance; information substantiating the steps immediately taken to minimize emissions; and a description of the steps taken to avoid similar malfunctions in the future.²⁶
- *Variances:* Petitions for variances are supposed to include an estimate of emissions.²⁷ In addition, the “Calculation of Excess Emission Fees” form that facilities are required to submit should include estimates of emissions.
- *Flaring:* SCAQMD Rule 1118 requires facilities to submit quarterly flaring reports that include the daily and quarterly emissions of criteria pollutants from each flare. The flare monitoring reports should include emissions from

flares resulting from upsets, as well as other causes.

Despite these reporting requirements, it was difficult to gather upset data from SCAQMD. While there is a requirement that breakdown reports include emissions estimates, many of the reports merely stated that emissions were greater than the regulatory threshold or included no information quantifying emissions. Likewise, although the Hearing Board variance records were supposed to include emissions estimates, many of the files did not. Because SCAQMD lacks a centralized reporting system for excess emissions, and because many of the reports we reviewed did not quantify emissions, we could not adequately evaluate the excess emissions from the five SCAQMD facilities studied.

Data: We reviewed breakdown and variance files for the following facilities:

Facility Name	Facility Location
Exxon Mobil	Torrance, CA
Chevron Texaco	El Segundo, CA
BP Amoco	Carson, CA
Conoco Phillips	Wilmington, CA
Conoco Phillips	Carson, CA

As can be seen from the attached spreadsheets, data regarding these facilities' upset emissions were often incomplete.²⁸ Because these reports did not give us a complete picture of excess emission from the facilities, we have not totaled emissions.

NOTES

- ¹ Environmental Working Group, "Still Above the Law: How California's Major Air Polluters Get Away With It" (July 29, 2004).
- ² The rules are not clearly written and could be subject to different interpretation. The interpretation included here is consistent with BAAQMD's stated interpretation.
- ³ BAAQMD Reg. 1-208.
- ⁴ *Id.*
- ⁵ BAAQMD Regs. 1-112 & 1-113.
- ⁶ *Id.*
- ⁷ Ca. Health & Safety Code §42352.
- ⁸ Clean Air Act §116.
- ⁹ BAAQMD Reg. 1-431.
- ¹⁰ BAAQMD Reg. 1-432.
- ¹¹ Hearing Board Rules Section 2.2d.
- ¹² BAAQMD Reg. 12-11-500.
- ¹³ BAAQMD Reg. 8-28-401.
- ¹⁴ 42 U.S.C. §114(a) & (c); 40 C.F.R. §2.301(a)(2)(i).
- ¹⁵ In commenting on a draft of this appendix, BAAQMD stated that its policy is that investigation reports should be available to the public upon request. If the investigation report is part of a notice of violation report, BAAQMD said it should be available in its entirety upon closure of the case.
- ¹⁶ <http://www.baaqmd.gov/enf/incidents/index.asp>.
- ¹⁷ Information on the BAAQMD spreadsheets included in the "Type of Event" column indicates the follow up taken by BAAQMD. NOV means a Notice of Violation was issued. BRG means breakdown relief was granted and NACT means no action taken. In addition, monitor outages are included separately at the end of the BAAQMD spreadsheets.
- ¹⁸ Communities for a Better Environment, "Refinery Flaring in the Neighborhood" (Spring 2004).
- ¹⁹ SCAQMD Rule 430(b)(3).
- ²⁰ *Id.*
- ²¹ Clean Air Act §§116 & 502(b).
- ²² SCAQMD Rule 504 does provide that variances may not be granted from NSPS or NESHAP standards.
- ²³ As EPA stated in its Notice of Deficiency for Indiana's Title V program, "Indiana's rule ... allows the state to address emission limit exceedances for startups, shutdowns, and malfunctions on a case-by-case basis in title V permits. This allows the permitting authority to establish through the title V permitting process limits which exceed applicable requirements. Because Title V does not give permitting authorities the authority to establish new emission limits, Indiana's program does not meet the program approval requirements of title V..." 66 Fed. Reg. 64039, 64040 (Dec. 11, 2001).
- ²⁴ SCAQMD Rule 430(b).
- ²⁵ *Id.*
- ²⁶ *Id.*
- ²⁷ SCAQMD rules 517 & 518.2 and Ca. Health & Safety Code §§42352 & 42353.
- ²⁸ The information on the SCAQMD spreadsheets included in the "Type of Event" column sometimes indicates the determination made, or follow-up action taken by SCAQMD. NOV means a Notice of Violation was issued.

SHELL MARTINEZ REFINERY BAAQMD • Martinez, CA
Emissions Data (Lbs./Event unless noted): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/5/02	#3 Sulfur Recovery Plant			16.0	>250 ppm/ hr								Malfunction
12/5/02	Steam Coil in Sulfur Pit												Excess Emission, Breakdown (NOV)
10/12/02	Cat Feed Hydrotreater & Cat cracker	PSV - Noo2		0.0		8			110				Malfunction
9/30/02	Effluent Treatment Plant												Excess Emission (NOV)
9/21/02	#7 Pond			1.0		60 ppb 3 min avg., 118 ppb peak; 35 ppb avg/ hr, 118 ppb peak							Malfunction
9/21/02	No Source ID												Excess Emission (NACT)
9/20/02	Sour Water Stripper #7												Excess Emission, Breakdown (NOV)
9/1/02	#3 Hydrogen Plant SMR Furnace			3.0				22 ppm @3% O ₂ /3 hr. avg					Malfunction
8/3/02	LOP Flare												Excess Emission (NOV)
7/20/02	#1 CO Boiler	#1 CO Boiler Stack	>30% <3min/hr	0.1									Excess Emission, Breakdown (NACT)
7/18/02													Excess Emission (NOV)
7/9/02	CCU Gas redistributor												Excess Emission (NOV)
7/4/02	HC Flare			0.1		141 ppm							Excess Emission (NOV)
7/2/02	DMDS Pump	Tubing											Excess Emission, Breakdown (BRG)
6/25/02	DEA Treatment System												Excess Emission (NOV)
6/25/02	SRU ₃												Excess Emission (NOV)
6/25/02	Dea Treatment System												Excess Emission (NOV)

Shell Martinez Refinery BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/25/02	DEA Treatment System												Excess Emission (NOV)
6/15/02	Fuel Gas DEA Treater			3.0		165ppm avg							Excess Emission (NOV, NACT)
6/8/02	Analyzer	Flame											
5/31/02	#2 CO Boiler	#2 CO Boiler Stack		0.7			500 - 600 ppm						Excess Emission (NACT)
5/25/02	Feed Heater			11.6				>10 ppm					Excess Emission (NOV)
5/10/02	#3 CO Boiler	#3 CO Boiler Stack		1.0			588 ppm average						Excess Emission (NACT)
5/9/02	#3 CO Boiler	#3 CO Boiler Stack		3.9			>500 ppm						Excess Emission (NOV)
5/8/02	#6 Pond (probably)			1.2		31 ppb 60 min avg/42 ppb peak							Excess Emission (NACT)
5/7/02	#3 Sulfur Recovery Plant			3.0	>500ppm								Excess Emission (NOV)
5/7/02	#6 Pond (probably)			0.7		31ppb 60 min avg/44 ppb peak							Excess Emission (NACT)
4/23/02	#3 Sulfur Recovery Plant	Catalytic Oxidizer		3.0	>250 ppm								Excess Emission (NOV)
4/19/02	#3 Sulfur Recovery Plant	MDEA System		1.0	>250 ppm								Excess Emission (NOV)
4/13/02	?			0.0									Excess Emission (NACT)
4/12/02	#2 CO Boiler	#2 CO Boiler Stack		1.0			591 ppm						Excess Emission (NACT)
4/1/02	#1 CO Boiler	#1 CO Boiler Stack	>20%	2.0			423 ppm; 523 ppm						Excess Emission, Breakdown (NACT)
3/28/02	Pressure relief device - E396	OPCen - Lean oil sponge chiller		0.0					190				Pressure (NACT)
3/12/02	O ₂ Analyzer	Calibration											
3/12/02	Analyzer	Calibration											
3/11/02	Analyzer Hiway	Power Supply											
3/9/02	Analyzer	Calibration											

Shell Martinez Refinery BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/26/02	?												Excess Emission, Breakdown (NACT)
2/26/02	#3 Hydrogen Plant			3.0				10.4 ppm					?
2/20/02	?												Excess Emission, Breakdown
2/14/02	#3 CO Boiler	#3 CO Boiler Stack	≥30%	0.0									Excess Emission (NACT)
1/13/02	OPCen Flare			1.5		>163 ppm		≤192/3hr avg					Excess Emission (NACT)
11/1/01	Vine Hill storage tank vapor recovery system	Pressure relief device - J127		1.2			334lbs; 23 PPMW					natural gas - 440 lbs	Pressure (NACT)
10/18/01	#3 CO Boiler	#3 CO Boiler Stack	≥30%	0.2									Excess Emission (NACT)
10/17/01	#2 CO Boiler	#2 CO Boiler Stack	up to 60% for a maximum of 15min/hr	0.3									Excess Emission (NOV)
10/17/01	#3 CO Boiler	#3 CO Boiler Stack	>60% for a maximum of 14 min/hr	0.3									Excess Emission (NOV)
10/16/01	Pressure relief device - J244	FCC gas plant debutanizer column		0.0			1700 lbs; 1100 PPMW					HC: 950 lbs	Pressure (NOV)
10/14/01	#2 CO Boiler	#2 CO Boiler Stack	up to 60% for a maximum of 41min/hr	2.3									Excessive Emission (NOV)
10/14/01	#3 CO Boiler	#3 CO Boiler Stack	up to 60% for a maximum of 20 min/hr	2.2									Excessive Emission (NOV)
10/12/01	Pressure relief devices - M31 & M36	Fluid Catalytic Cracker		0.1		6.3lbs	5800lbs 1000 PPMW					HC: 7300	Pressure (NOV)
10/12/01	CCU	#3 CO Boiler Stack	>20%	0.7									Excess Emission (NACT)
10/2/01	#3 CO Boiler	Dust hopper	>3min of >Ringleman 1 in an hour	0.1									Excess Emission (NACT)

Shell Martinez Refinery BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/30/01	CO boiler	FCC Flue gas emission		19.5		100l	Likely but no monitor					Carbon sulfide - 100; formaldehyde - 100; acetaldehyde - 1000 hydrogen cyanide - 10; ammonia - 100	Breakdown (BRG)
9/18/01	Lube Hydrotreater			0.0		66 ppb							Excess Emission (NOV)
8/28/01	Furfural Unit	Furfural Column											?
8/23/01	Tank 1161			1.2		>30 ppb							Excess Emission (NOV)
8/22/01	Cat Cracker	Pressure relief device - J244		0.1		1 lb						HC: 3200 lbs	Pressure (NACT)
8/9/01	Fuel gas system	Hydrocracker		1.1		169.03 ppm peak							Pressure (NOV)
8/9/01	Fuel gas system	Hydrocracker		2.1		>163ppm							Pressure (NOV)
8/9/01	#3 Hydrogen Plant - 4161	Pressure swing absorbtion		144.0			54000lb (450 lb/hr for 5dy) = 27tons = more than CO permit/month (26.3)						Excess Emission, Breakdown (BRG)
8/9/01	Pressure relief devices - J231 & J232	Hydrocracker		0.1		17 lbs						HC: 670 lbs	Excess Emission (NOV)
8/9/01	Pressure relief devices - M50 & M53	Hydrocracker		0.1		150 lbs						HC 12000 lbs	Excess Emission (NACT)
7/27/01		Straight Run Hydrotreater		0.0		4.3 lbs						HC: 1500 lbs	Pressure (NOV)
7/18/01	Pressure relief devices - M50 & C82	Naptha Hydrotreater, c-82		0.3		80 lbs						HC: 31,000 lbs	Pressure (NOV)
7/9/01	CFU unit	Fuel Gas Treaters		5.0		163 ppm							Excess Emission (NOV)
7/9/01	CFU unit	Fuel Gas Treaters		6.4		163 ppm							Excess Emission (NOV)
7/2/01	#2 Sulfur Plant			2.0	250 ppm								Excess Emission (NOV)
5/18/01	Fuel Gas System			2.3		164 ppm							Excess Emission (NOV)

Shell Martinez Refinery BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
5/18/01	Fuel Gas System			3.0		192 ppm							Excess Emission (NACT)
5/18/01	#3 hydrogen plant - 4161			0.8				11.2 ppm					Breakdown, Excess Emission (NACT)
4/18/01	#3 Sulfur Recovery Plant			1.0	79 ppm								Excess Emission (NOV)
4/3/01		Catalytic Cracking Unit		2.0			500 ppm						Excess Emission (NOV)
3/19/01	?			0.0		60 ppb							Excess Emission (NOV)
3/5/01	PG&E natural gas header	PRD N-25		0.1								Natural gas: 3680 lbs	Pressure (NACT)
2/7/01	#3 Hydrogen Plant 3 SMR Furnance			3.0				10.7 ppm					Excess Emission (NACT)
2/6/01	#4 Sulfur Recovery Plant			1.0	250 ppm								Excess Emission (NOV)
1/25/01	#3 Sulfur Recovery Plant			1.0	267 ppm								Excess Emission (NOV)
1/16/01	?			0.4		60 ppb							Excess Emission (NOV)

Monitor Outages

12/28/02	Calibrator												Inoperative
12/26/02	Calibrator/Span Drift test Failed												Inoperative
12/20/02	Failed Span Drift Test												Inoperative
12/20/02	Process Analyzer												Inoperative
12/15/02	Calibrator												Inoperative
12/12/02	Low Sample Flow												Inoperative
12/8/02	O ₂ Analyzer												Inoperative
12/7/02	Calibrator												Inoperative
12/5/02	CEMS Sample Cooler Failure												Inoperative
12/4/02	Analyzer												Inoperative
12/3/02	Analyzer												Inoperative
11/28/02	Calibrator												Inoperative
11/27/02	?												Inoperative
11/26/02	Calibrator												Inoperative
11/24/02	Calibrator												Inoperative

Shell Martinez Refinery BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/23/02	Analyzer												Inoperative
11/20/02	Calibrator												Inoperative
11/20/02	Calibrator												Inoperative
11/20/02	Data Collection System												Inoperative
11/13/02	Calibrator												Inoperative
11/10/02	Sample Tubing												Inoperative
11/5/02	Calibrator												Inoperative
11/4/02	Electrical												Inoperative
11/3/02	Calibrator												Inoperative
10/30/02	?												Inoperative
10/29/02	Contamination of Stretford Solution												Inoperative
10/27/02	Calibrator												Inoperative
10/22/02	Calibrator												Inoperative
10/22/02	Card Failure												Inoperative
10/13/02	Substation Maint.												Inoperative
10/10/02	Flame out												Inoperative (NOV)
9/24/02	Electrical Power												Inoperative
9/9/02	Sample Line Plugging												Inoperative (NOV)
9/2/02	Calibrator												Inoperative (NOV)
8/31/02	Calibrator												Inoperative
8/31/02													Inoperative
8/30/02	Sample Tube												Inoperative
8/29/02	?												Inoperative
8/21/02	Calibrator												Inoperative
8/12/02	O ₂ Cell												Inoperative
8/9/02	Alternator Switch												Inoperative
8/8/02	?												Inoperative
7/26/02	Calibrator												Inoperative
7/25/02	Calibrator												Inoperative
7/14/02	O ₂ Analyzer												Inoperative
7/13/02	Calibrator												Inoperative

Shell Martinez Refinery BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
7/9/02	Air-Conditioning												Inoperative
7/8/02	Calibrator												Inoperative
7/4/02	Sample Line												Inoperative
7/3/02	Calibrator												Inoperative
7/2/02	Hydrocracker, Dimethyl disulfide spill			0.0		80 ppb 60 min avg/130 ppb peak							Inoperative
7/1/02	Calibrator												Inoperative
6/26/02	Calibrator												Inoperative
6/24/02	Calibrator												Inoperative
6/23/02	Sample System												Inoperative
6/20/02	Analyzer												Inoperative
6/15/02	Analyzer												Inoperative
6/7/02	Calibrator												Inoperative
6/6/02	Pump												Inoperative
5/31/02	Calibrator												Inoperative
5/27/02	Calibrator												Inoperative
5/25/02	Calibrator												Inoperative
5/4/02	Analyzer												Inoperative
5/2/02	Calibrator												Inoperative
4/29/02	Cal Gas Line	Low Flow											Inoperative
4/28/02	Calibrator												Inoperative
4/2/02	Stack O ₂ Analyzer												Inoperative
3/22/02	Analyzer	Calibration Water											Inoperative
3/22/02	Analyzer	Calibration Water											Inoperative
3/22/02	Analyzer	Calibration											Inoperative
3/18/02	Analyzer	Flame											Inoperative
3/5/02	#1 Sulfur Plant			390.5									Inoperative (NOV)
3/5/02	Sample Line	Leak											Inoperative
2/23/02	Analyzer	Electronic Data Collection											Inoperative (NOV)
2/22/02	Sample Line	Plug											Inoperative
2/20/02	Analyzer	Calibration											Inoperative
2/15/02	Calibrator												Inoperative

Shell Martinez Refinery BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/4/02	Motor												Inoperative
1/29/02	Solenoid Valve												Inoperative
1/21/02	Cal Gas Regulator												Inoperative
1/20/02	Calibrator												Inoperative
1/9/02	Analyzer Pump												Inoperative
1/9/02	Sample System												Inoperative
1/6/02	Analyzer												Inoperative
1/6/02	Analyzer												Inoperative
1/6/02	Analyzer												Inoperative
1/5/02	Analyzer												Inoperative
12/31/01	Analyzer												Inoperative
12/31/01	Analyzer	Flame											Inoperative
12/25/01	Analyzer												Inoperative
12/25/01	Analyzer												Inoperative
12/22/01	Analyzer												Inoperative
12/17/01	Nox Analyzer												Inoperative
12/15/01	Vacuum Pump												Inoperative
12/13/01	Detector and Valve												Inoperative
11/28/01	Analyzer	Flame											Inoperative
11/23/01	Calibrator												Inoperative
11/21/01	Calibrator												Inoperative
11/16/01	Control Air Conditioner												Inoperative
11/12/01	Sample Pump												Inoperative
11/12/01	Sample Inlet Line												Inoperative
11/12/01	Analyzer Span												Inoperative
11/2/01	Calibration Failure												Inoperative
10/30/01	Analyzer												Inoperative
10/26/01	Sample Lines												Inoperative
10/26/01	Analyzer												Inoperative
10/21/01	Cal Gas Line												Inoperative
10/20/01	Flow Meter												Inoperative
10/20/01	Sample Conditioning	Bad Solenoid Valve											Inoperative

Shell Martinez Refinery BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/18/01	Sample Line												Inoperative
10/16/01		Sample Flow Rate											Inoperative
10/7/01	Flow Meter												Inoperative
10/7/01	Analyzer												Inoperative
10/2/01	Sample Fliter												Inoperative
9/18/01	Electronics												Inoperative
9/10/01	Maintenance												Inoperative
9/1/01	Analyzer												Inoperative
8/30/01	Analyzer												Inoperative
8/28/01	Sample Chiller												Inoperative
8/28/01	Analyzer												Inoperative
8/28/01	Analyzer												Inoperative
8/22/01	Analyzer												Inoperative
8/12/01	Analyzer												Inoperative
8/9/01	Analyzer												Inoperative
8/7/01	Analyzer												Inoperative
8/3/01	Analyzer												Inoperative
8/2/01	Analyzer												Inoperative
7/29/01	Analyzer												Inoperative
7/27/01		Analyzer											Inoperative
7/19/01	Analyzer												Inoperative
7/16/01	Analyzer												Inoperative
7/5/01	#4 EMSR ₁ Boiler			478.5				?					Inoperative (VOID)
6/29/01	Analyzer												Inoperative
6/28/01	Sample System												Inoperative
6/27/01	Analyzer												Inoperative
6/16/01	Analyzer												Inoperative
6/16/01	Analyzer												Inoperative
6/13/01	Analyzer												Inoperative (NACT)
6/13/01	Analyzer			Not Specified									Inoperative
6/11/01	Analyzer												Inoperative

Shell Martinez Refinery BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/3/01	Analyzer												Inoperative
5/28/01	Analyzer												Inoperative
5/26/01	Analyzer			2.0				?					Inoperative (NACT)
5/23/01	Analyzer												Inoperative
5/21/01	Analyzer												Inoperative
5/15/01	#4 Sulfur Recovery Unit			139.0	?								Inoperative (NOV)
5/8/01	Analyzer												Inoperative
5/6/01	Analyzer												Inoperative
4/15/01	Fliexigas H ₂ S analyzer			1.0		Excess							Inoperative
3/26/01	Monitor												Inoperative
3/24/01	Analyzer												Inoperative
3/18/01	Monitor												Inoperative
3/17/01	Monitor												Inoperative
3/4/01	Analyzer												Inoperative
2/26/01	Analyzer												Inoperative
2/11/01	Analyzer												Inoperative
2/3/01	Electric data capture system			41.0								Flow	Inoperative (NOV)
1/27/01	o ₂ cell			0.0									Inoperative
1/15/01	Inoperative parametric			225.6								Flow	Inoperative (NOV)
1/12/01	Electric data capture system			75.0									Inoperative (NOV)
1/7/01	Analyzer												Inoperative
1/4/01	Sample System												Inoperative

TESORO BAAQMD • Martinez, CA
Emission Data (Lbs./Event unless otherwise noted): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/30/02	SRU												Excess Emission (NOV, NACT)
12/23/02	Facilitywide												Excess Emission (NACT)
12/18/02	Firebox Burner												Excess Emission (NOV)
10/31/02	Pulsation Dampner												Excess Emission (NOV)
10/27/02	O ₂ Enrichment Valve												Excess Emission (NOV)
10/19/02	?												Pressure (NACT)
10/18/02	Furnace 17			3.0		>160 ppm							Excess Emission (NOV)
9/26/02	Central Deck												Breakdown (NACT)
9/26/02	ESP Dampner												Excess Emission (NACT)
9/12/02	Air Blower												Excess Emission (NOV), Pressure (NACT)
8/23/02	?												Excess Emission (NOV)
8/9/02	Under Investigation												Excess Emission (NOV)
7/29/02	Electro Static Precipitator												Excess Emission (NACT)
7/26/02	SRU	Dea pump		2.0	405 ppm								Excess Emission (NOV, BRG), Breakdown (BRG),
5/23/02	Facilitywide												Excess Emission, Breakdown (NACT)
5/22/02	Pan												Breakdown (NOV)
4/10/02	Control Module												Excess Emission, Breakdown (NACT)
4/8/02	Substation												Excess Emission (NACT)
4/5/02	By-pass Controller												Excess Emission (NACT)

Tesoro BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
3/13/02	#5 Boilerhouse		>20%	10.3									Excess Emission (NACT, NOV)
3/10/02	Under Investigation												Excess Emission (NACT)
2/27/02	Coker Sluice Tank		>20%	0.3									Breakdown (NACT)
2/26/02	Cold Coke Riser												Breakdown (NOV)
2/22/02	SRU			1.0	269.5 ppm								Excess Emission (NACT)
1/20/02	Facilitywide			0.8		>60 ppb							Excess Emission (NACT)
1/13/02	SRU			1.5	>250 ppm								Excess Emission (NOV)
1/5/02	Fuel Gas Mixpot			3.8		>160 ppm							Excess Emission (NACT)
1/4/02	Unknown			1.0		>30 ppb							Excess Emission (NOV)
1/2/02	Waterfront	Tank farm tract		0.0		62 ppb avg.; 84 ppb peak							Excess Emission (NACT)
12/28/01	#6 Boilerhouse		>20%	16.7									Excess Emission (NOV)
12/28/01	Facilitywide			24.0				.050 lb/MMBTU/day avg.					Facilitywide NOx Bubble Limit, Excess Emission (NACT)
12/24/01	R135												Breakdown (NACT)
12/21/01	Boiler S-1469												Excess (NACT)
12/21/01	No Known Problem			0.0		>60 ppb							Excess Emission (NOV)
12/17/01	Package Boiler												Excess (NACT)
12/15/01	SRU			3.0	>250 ppm								Excess Emission (NOV)
12/13/01	Transformers												Excess Emission (BRG)
12/12/01	Facilitywide												Excess Emission (NACT)
12/11/01	Facilitywide												Excess Emission (NACT)
12/11/01	Leaking condenser			4.4	>50 ppb								Excess Emission (NOV)

Tesoro BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/10/01	Fuel Gas			24.0	>29 lbs per mmbtu								Malfunction
12/10/01													
12/10/01	#56 Furnance			67.0				>40 ppm					
12/10/01													
12/9/01	#6 Boilerhouse			91.9	>250 ppm								?
12/9/01	SRU			1.0	317 ppm								Excess Emission, Breakdown (BRG)
12/9/01	Facilitywide			24.0				?					Facilitywide NOx Bubble Limit
11/27/01	Secondary Seal - 312			?									Breakdown (NOV)
11/26/01	Under Investigation			0.1		>60 ppb							Excess Emission (NOV)
11/7/01	Turnaround & Feed Out												Excess Emission (NACT)
11/4/01	Turnaround & Feed Out												Excess Emission (NACT)
10/11/01	Under Investigation												Excess Emission (NACT)
9/18/01	Under Investigation												Excess Emission (NACT)
9/18/01	Amonia Recovery												Excess Emission (NACT)
9/18/01	SRU			9.4	430 ppm; 435 ppm; 500 ppm; 461 ppm; 470 ppm								Excess Emission (NOV)
9/15/01	#7 Boilerhouse		>20%	0.9									Excess Emission (NOV)
8/26/01	Facilitywide												Excess Emission (NACT)
7/21/01	SRU												Excess Emission (NACT)
7/19/01	SRU			1.0	360 ppm								Excess Emission (NOV)
7/16/01	Under Investigation												Breakdown (NACT)
7/6/01	Tank - 312			?								hydrocarbon	Breakdown (EMI)

Tesoro BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
7/1/01	SRU			1.0	304 ppm								Excess Emission (NOV)
6/13/01	Analyzer												Inoperative
6/13/01	Compressor												Pressure (VOID)
5/17/01	#1 Feed Prep Water Spray												Excess Emission (NOV)
4/11/01	SRU			1.1	>250 ppm								Excess Emission (NOV)
3/10/01	SRU												Excess Emission (NACT)
2/22/01	Amonia Injection Heater												Excess Emissions, Breakdown (NACT)
2/16/01	?												Excess Emission (NACT)
2/11/01	SRU	Steam system	>50%	2.0	>500 ppm								Excess Emission (NOV)
2/10/01	#5 Boilerhouse		>50%	12.7	>500 ppm								Excess Emission, Breakdown (NOV)
2/8/01	Facilitywide												Excess Emission (NACT)
1/29/01	Facilitywide												Excess Emission (NACT)
1/24/01	Facilitywide												Excess Emission (NACT)
1/23/01	Facilitywide												Excess Emission (NACT)
1/21/01	Facilitywide												Excess Emission (NACT)
1/17/01	Facilitywide												Excess Emission (NACT)
Monitor Outages													
12/21/02	Probe Heater	Common Fault Alarm											Inoperative
12/14/02	Blower												Inoperative
12/10/02	Sample Tank	Under Investigation											Inoperative
12/8/02	Drain Pump												Inoperative
11/3/02	Sample Line												Inoperative
10/29/02		Possible Leak											Inoperative

Tesoro BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/28/02	Under Investigation												Inoperative
10/19/02	Chiller Drain												Inoperative
10/14/02	Sample Line												Inoperative
10/3/02	CEM												Inoperative
9/21/02	Calibrator												Inoperative
9/11/02	Calibrator												Inoperative
8/24/02	System												Inoperative
8/23/02	Regulator												Inoperative
6/28/02	Under Investigation												Inoperative
6/21/02	Equipment Repairs												Inoperative
6/19/02	Air Conditioning												Inoperative
5/30/02	Measuring Cell												Inoperative
5/26/02	Sample Lines												Inoperative
4/30/02	CEM												Inoperative
4/5/02	Output Module												Inoperative
3/1/02	System												Inoperative
2/24/02	Unknown												Inoperative
2/20/02	Xmitter												Inoperative (NOV)
12/27/01	Facilitywide			0.0		>60 ppb							Inoperative
11/24/01	Sample Gas Rotometer												Inoperative
10/16/01	Lost Calibration												Inoperative
10/5/01	?												Inoperative
9/17/01	Line												Inoperative
9/1/01	Analyzer												Inoperative
8/28/01	Calibrator	Gas Leak											Inoperative
8/20/01	Monitor												Inoperative
7/30/01	PEN												Inoperative
6/9/01	#6 Boilerhouse		>20%	8.2									Inoperative
6/6/01	CEM												Inoperative
6/2/01	Valve												Inoperative
5/30/01	Ink Pen												Inoperative

Tesoro BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
5/19/01	Source Lamp												Inoperative
5/9/01	Cooler Unit												Inoperative
4/15/01	Instrumentation												Inoperative
4/14/01	Various Components												Inoperative
4/1/01	Sample Line												Inoperative
3/12/01	Switch												Inoperative
3/6/01	Line												Inoperative
2/17/01	O ₂ Analyzer												Inoperative

VALERO BAAQMD • Benicia, CA
Emissions Data (lb./event unless otherwise noted): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/19/02		SG-1032 Boiler		1.4			>50 ppm						Breakdown (BRG)
12/19/02	Main stack	FCCU Regenerator	2.5 ppm	0.7									Excess Emission (MIS)/ Breakdown (NACT)
12/4/02	Furnance 4460	Hot Oil Burner		1.8				10.4 ppm					Excess Emission (NACT)
11/20/02	Main stack	FCCU Regenerator	≥30%	1.0									Excess Emission (NACT)
11/9/02	Substation												Excess Emission/ Breakdown (NOV)
11/8/02	?												Excess Emission (NOV)
10/12/02	SCR system	Furnance 4460		0.9				11 ppm					Excess Emission (NACT)
10/11/02	SCR system	Furnance 4460		7.0				15.9 ppm					Excess Emission/ Breakdown (BRG)
10/3/02	Ammonia Vaporizer												Excess Emission/ Breakdown (NOV)
10/1/02	Fuses												Excess Emission/ Breakdown (NOV)
9/28/02	Injection Quill												Excess Emission/ Breakdown (NOV)
9/23/02	Main stack	FCCU Regenerator	≥30%	0.2									Excess Emission (NACT)
6/6/02	Analyzer												Excess Emission/ Breakdown (NOV)/ Inoperative
6/3/02	Flare gas compressor	South Flare	1 Ringlemann	4.7									Excess Emission/ Breakdown (NOV)
6/3/02	Main stack	FCCU Regenerator	2.2 Ringlemann	0.0									Excess Emission/ Breakdown (NOV)
6/3/02	Flare gas compressor	North Flare	1 Ringlemann	4.7									Malfunction
5/30/02	Coker Burner	FCCU Regenerator	≥30%	0.0									Excess Emission/ Breakdown (NACT)
5/21/02	?												Breakdown (NOV)

Valero BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
5/16/02	Coker Burner	FCCU Regenera- tor	≥30%	0.1									Excess Emission/ Breakdown (NACT)
5/14/02	Coker Burner	FCCU Regenerator	≥20%	0.2									Excess Emission/ Breakdown (NACT)
5/1/02	"B" Cell Rectifiers	main stack	≥30%	3.6									Excess Emission/ Breakdown (NACT)
4/22/02	PR-101BOutlet	FCCU Regenera- tor	≥30%	0.1									Excess Emission (NACT)
4/16/02	Coker Burner												Excess Emission, Breakdown (NOV) (NACT)
2/25/02	Boiler Feed			0.0									Breakdown (NOV)
2/18/02	Coker Burner	FCCU Regenerator	≥30%	0.0									Excess Emission (NACT)
1/28/02	Analyzer												Excess Emission (NOV), Inoperative
1/7/02	Coker Burner	FCCU Regenera- tor	≥30%	0.1									Excess Emission (NACT)
1/6/02	?												Excess Emission (NOV)
1/5/02	Coker Burner	FCCU Regenerator	≥30%	0.5									Excess Emission (NACT)
1/4/02	FCCU Regenerator			0.0									Excess Emission (NACT)
1/4/02	Coker Burner	FCCU Regenera- tor	≥30%	0.2									Excess Emission (NACT)
1/3/02	Boiler												Excess Emission, Breakdown (NOV)
12/18/01	Electrical Short												Excess Emission, Breakdown (NOV)
11/29/01	Asphalt plant fuel gas			0.1		≤12ppm/3 hr. avg.							Process fuel production
10/19/01	Process Gas Turbine	SRC system		2.6				11.1 ppm					Excess Emission (NOV)
9/24/01	Coker Burner	FCCU Regenerator	≥30%	0.1									Breakdown (NACT)
9/19/01	Coker Burner	FCCU Regenerator	≥30%	0.2									Excess Emission (NACT)

Valero BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/17/01	Crude Preheat Furnace (F-101)	FCCU dump stack	≥30%	0.2									Breakdown/ Excess Emission (BRG)
9/1/01	Scrubbing system	Fuel Gas		0.7		165.30 ppm							Excess Emission (NACT)
8/27/01	Scrubbing system	Fuel Gas		1.5		178.94 ppm							Excess Emission (NACT)
7/5/01	Amonia Injestion System	Main Stack	≥30%	0.1				?					Excess Emission, Breakdown (NACT)
7/3/01	Process Gas Turbine (GT-702)	Ammonia injection nozzle		1.0				11 ppm/ 1 hour					Excess Emission (NACT)
6/23/01	Boiler & SCR												Excess Emission, Breakdown (BRG)
6/21/01	Process Gas Turbine (GT-702)			122.3				excess greater than 9 ppm/3 hour					
5/20/01	Unknown	Flexsorb Stack		0.0		greater than 60 ppb /3 minutes							Excess Emission (NACT)
5/12/01	Process Gas Turbine (GT-702)	Steam generator (SG-702)		3.0				13.3 ppm					Excess Emission (NOV)
4/20/01	Cat Feed Hydrofiner	MEA Absorber Tower (T-601)		0.0		96 ppb (avg)							Excess Emission/ Breakdown (NOV)
3/26/01	Sulfur Recovery Unit "B"	Flexsorb Stack		0.1		136 ppb (avg)							Excess Emission (NOV)
3/14/01	SRU	Analyzer											Excess Emission, Breakdown (BRG)
2/1/01	LPG	Monitor											Excess Emission (NACT)
1/23/01	?												Excess Emission (NACT)
1/5/01	HCU	Leak											Breakdown (NACT)
1/5/01	HCU	H ₂ Vent											Excess Emission (NACT)
Monitor Outages													
11/27/02	Analyzer												Inoperative
11/26/02	FE-32 Flow Totalizer on Crude Unit												Inoperative

Valero BAAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/20/02	CEM												Inoperative
9/17/02	Analyzer												Inoperative
8/30/02	Monitor												Inoperative (NOV)
8/29/02	Analyzer												Inoperative
8/16/02	Analyzer												Inoperative
7/3/02	wwf205 Vapor Flow Meter												Inoperative
4/20/02	Analyzer												Inoperative
12/22/01	O ₂ and CO ₂ Chems failed												Inoperative
12/4/01	Analyzer												Inoperative
11/24/01	Analyzer												Inoperative
11/2/01	Analyzer												Inoperative
10/27/01	Failed Detector												Inoperative
8/12/01		S# 31, 32, 33											Inoperative
7/15/01	Analyzer	Sample Tubing											Inoperative
7/8/01	Analyzer												Inoperative
5/29/01	CO Detector												Inoperative
3/12/01	Sample Lines												Inoperative
2/26/01	Detector												Inoperative
2/25/01	?												Inoperative

BP WEST COAST PRODUCTS SCAQMD • Carson, CA
EMISSIONS DATA (LBS./EVENT): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/30/02	FCCU ESP			1.5								PM 290	Breakdown
11/26/02	Cogen units			0.7	41.8								Invalid Breakdown (NOV issued)
11/25/02													
11/18/02	NE Tank Farm	Vapor Recovery Sys.		25.0								"negligible emissions"	
10/22/02	Compressor	Flare	excess	0.1	7.0		5,793.0	1,065.0				PM 257; ROG 986	Invalid Breakdown
10/20/02													
09/23/02	ESPs for FCCU		20+									PM 11.9	
09/06/02	CEMS to Turbine												
08/24/02	Coker Plant	Fire & Flare		0.4	14,080.0		14,836.7	3,014.0				ROG 2529.7	
08/12/02	FCC	ESP exhaust stack	85 (smoke)										
03/01/02	Claroil pump at cc unit	Leak											Invalid Breakdown
02/21/02	Loading rack												Breakdown
01/25/02	Coker Frac Swing Tower	Leak											NOV
6/8/01	FCCU Main Air Blower	Fire	smoke									SO ₂ , CO, PM	
06/04/01	Analyzer failure												
05/25/01	FCCU	Flare, ESP	smoke									SO _x	Breakdown
05/07/01	Uacuum Unit fire												
2/4/01	No. 2 Crude Fin Fan	Leak		3.3					56.0				

CHEVRON EL SEGUNDO SCAQMD • El Segundo, CA
Emissions Data (Lbs./Event unless otherwise noted): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/7/02													breakdown
11/26/02	Cogen Unit A Train			1.2				over 9ppm					breakdown
11/20/02													
11/8/02	Cogen Unit A Train	Flare										SO ₂ , CO	retrofitting
10/16/02	Compressor Spillback system IP Transducer	Flare		4.0								SOx, NOx, H ₂ S	breakdown
10/15/02	K-751 Blower	Incinerator stacks										SOx & NOx	breakdown
10/14/02	SRU blower											SOx, NOx, H ₂ S	operator error (NOV)
10/13/02													
9/24/02	PRD	Spill										20 barrels crude	breakdown
9/23/02													breakdown
8/26/02	Suflur Plant			20.3	46.5								
8/19/02	Coker Unit												breakdown
6/10/02	Wash pad fire												breakdown
5/30/02	SMR plant												
5/23/02	Tank 209	Spill										3 barrels methanol	breakdown
5/23/02	Ammonia feed pumps lost power												
5/1/02	Alky Plant Debutanizer Reflux Pump											gas leak with over 50,000 ppm/dy	variance denied
4/19/02	CoGen Train C			0.2								CO exceedance	
3/21/02	Compressor plugged line												no violations
2/26/02	Vacuum Resid De-Sulfurization unit	Seal Oil Reservoir										sour H ₂	invalid breakdown; NOV issued
2/20/02	Wet Gas Compressor	FCC Flare	smoke										
2/18/02													breakdown
1/28/02	Boiler Feed Water Pump											no violations	breakdown
1/20/02	VRDS Unit	Fire		3.0	3,413.4	25,375.0		31.3				DEA 457.07, HC 22985	
1/10/02	SNR Furnace											PM11855.5	variance

Chevron El Segundo SCAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/27/01	Cogen B Steam Injection			1.0				23.9					
12/13/01	Fuel gas mixture gas analyzer												breakdown
12/6/01	Heater F201-A at #2 Resid Unit											no excess emissions	breakdown
12/6/01	Cogen B Steam Injection			2.0				19.1					no violation
12/5/01	Heater F201-A at #2 Resid Unit			0.3								no excess emissions	
12/4/01	Cogen A Train and Heater F201A			0.1								no excess emissions	breakdown
12/1/01													breakdown
11/28/01	#2 Resid Unit heater F201A			0.2								no excess emissions	breakdown
11/27/01	#2 Resid Unit heater F201A			0.5								no excess emissions	
11/25/01	Steam Naphtha Reformer											no excess emissions	
11/7/01	Cogen Trains A & C			5.0								no excess emissions b/c limits don't apply during SS	
9/21/01	Boiler 39			0.2			11.6						breakdown
9/11/01	SRU #70 Stack			0.7	285.7								
9/5/01	#2 Resid. Heater F201A			0.1								no excess emissions	shutdown
9/4/01	Strainer on Pump P-22	spill										10-20 barrels crude naphtha	breakdown
8/25/01													invalid Breakdown (operational not mechanical problem)
8/24/01													breakdown
8/15/01	Heater F-201A			3.0				2.3					
7/26/01	Compressor K-302	FCCU Flare		2.8				16.6					
7/15/01													
7/13/01	Heater F-1330							5.6					invalid Breakdown (NOV issued)
7/5/01	SCR serving CoGen Train B			0.3								NO _x	breakdown

Chevron El Segundo SCAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/27/01	Heater F-201A at #2 Resid Unit											no excess emissions	
6/21/01	SNR furnice											PM:	breakdown
6/19/01	Exchanger E322 at DFH Unit			1.3								no excess emissions	breakdown
6/18/01	Cogen B Train			0.3			0.1						breakdown
6/17/01													invalid breakdown
6/15/01	NH ₃ Injection			0.2				6.3					breakdown
5/16/01	Heater F-201A serving #2 Resid Unit			0.3			1.1						
5/16/01	Heater F210A serving #2 Crude Unit											no excess emissions	breakdown
5/11/01													breakdown
4/17/01	NH ₃ Injection serving #4 Crude Unit heaters			31.0								no excess emissions b/c no NOx limit	
4/14/01													
4/5/01	LSFO Flare, Compressors			0.4	3.6			1.6					breakdown
4/3/01	Basin F6			4.8					2.0				
3/30/01	NH ₃ injection serving heaters at VRDS			0.4								no excess emissions b/c RECLAIM	breakdown
3/28/01												PM: 5214	breakdown
3/27/01	NH ₃ Injection serving #4 Crude Unit heaters			13.0								no excess emissions b/c no NOx limit	breakdown
3/27/01	NH ₃ Injection serving Cogen C Train			0.4								no excess emissions b/c RECLAIM	breakdown
3/24/01													
2/20/01	Compressor K-951			3.1	47.0	0.5		17.6					
2/19/01	NH ₃ Injection serving #4 Crude Unit Heater											no rules violated	breakdown
2/14/01	tank 997	Floating roof		72.0					788.0				variance (breakdown)
2/14/01													
2/13/01	Compressor K-951			4.3	218.4	2.4		18.9					breakdown

Chevron El Segundo SCAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/10/01													
2/5/01	NH ₃ injection serving Heater F1330			18.8				324.0					breakdown
1/31/01	Unit 118 heater												breakdown
1/30/01	Incinerator F205 serving SRU 20		exceeded	5.0									breakdown
1/26/01	Compressor K-951			3.3	31.4	0.3		9.9					breakdown
1/22/01	CO Boiler #39			0.3								CO exceedance	invalid breakdown (operational problem)
1/20/01	Cogen C Train			0.4			2.2						invalid breakdown
1/1/01	Compressor K-951								1,791.5				

CONOCO PHILLIPS SCAQMD • Carson, CA
Emissions Data (Lbs./Event): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/2/02	Boiler 10												
6/19/02	FCCU												Variance Denied
5/8/02	Sulfur Plant No. 2			120.0	0.5	3.2							Variance (maintenance)
5/6/02	Boiler 10			0.3									
1/9/02	FCCU		60-100									1,400 PM	Variance (startup after turnaround)
11/9/01	Boiler 10 & 11												Breakdown
6/22/01	FCCU		20-60 (as high as 100)	96.0								1,400 PM	Variance (startup after maintenance)
4/25/01	Coker Unit	Cleanup		216.0								unspecified	Variance
4/23/01	Coker Unit	Fire											Breakdown (NOV for H&S 41701(a))
3/7/01	Vacuum Unit	Valve											Invalid Breakdown (acknowledged poor maintenance, no NOV)
3/3/01	Coker Unit	Fire											
2/8/01	FCCU		40	144.0								1,400 PM	Variance (startup after maintenance)
1/10/01	SRU 2	Valve Failure											Request for Variance
1/19/01	Facility			288.0					604.8				Variance (for additional throughput)
1/9/01	SRU tailgas unit	Flare											Breakdown but still NOV for nuisance

CONOCO PHILLIPS SCAQMD • Wilmington, CA
Emissions Data (Lbs./Event): 1.1.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/12/02	Cogen Unit			0.3								NOx	
11/16/02	Cogen	Flare						12.2					Breakdown
9/8/02													
9/4/02	Transformer	Sulfur Pit Blower											Breakdown
7/16/02	Vent Blower												
3/7/02	Tank vapor recover blowers												
3/7/02	Absorbor tower line at acid plant												
1/8/02	Boiler #6			2.5									
12/12/01													
9/11/01	Sulfur pit blower failure											H ₂ S	Breakdown
8/21/01													
6/21/01	FCC Unit	Flares	smoke										
6/18/01	Precipitator		exceeded									PM	Invalid breakdown (NOV)
3/2/01	Level controller malfunction												
1/31/01													

EXXON MOBIL SCAQMD • Torrance, CA
Emissions Data (Lbs./Event): 1.1.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/29/02													
12/16/02													
12/10/02	Bypass dampers							550.0					Variance (testing)
12/5/02	Vapor recovery system Tank 510x4			144.0	1.0		875.0	161.0				PM 15, 149 NMHC	Breakdown (Variance)
12/4/02	Tanks	Vapor recovery line		3.5					1.0				Breakdown
12/3/02	SCR												
11/28/02	SCR heater 19F-1												
11/25/02													
11/19/02	Pump barring failure	Fire	20+	0.1									Invalid Breakdown
11/16/02													
11/15/02													
11/12/02	Multiple sources			312.0				2,999.1					Variance
11/4/02													
10/29/02		Flare	20+	0.6									Breakdown
10/26/02	2K1 Compressor	Flare		12.3				1,765.0					Breakdown
10/23/02	FCCU blower			0.7								No excess b/c under RECLAIM	Breakdown
10/18/02	Tank 500 x1 chiller	Leak		432.0								Freon 12	Invalid Breakdown (NOV issued)
10/16/02	Coke barn	storage piles		2,160.0								PM10	Variance
9/30/02													
9/27/02													
9/19/02	Coker Unit	Fire & Flare	20+	0.5	722.0	43.0		17.0	11,148.0	45			Breakdown
9/12/02	ESP power failure	Flare	20+	7.0								PM 33.6	Breakdown
9/9/02	Hydrogen unit pressure swing absorber			12.0	3,573.0		2,340.0	430.0				PM 136	Breakdown
9/1/02													
8/29/02	SCR			0.1				309.0					Breakdown
8/15/02	Hydrogen unit pressure swing absorber		20+	22.0									Breakdown
8/6/02	FCCU main air blower		20+	18.0	180.0			800.0				PM 15.1	Breakdown

Exxon Mobil SCAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
8/3/02													
8/2/02	Tank 400x31 valve	Flare		2.8	0.0			3.6					Breakdown
7/3/02	Units 1F1 & 1F2	Units 1F1 & 1F2		2,160.0				32,000.0					Variance denied
6/10/02	Crude Heater 1F-2 bypass vent	Vent		0.4				14.8					?
3/5/02													
2/21/02													
2/19/02	Hydrogen Unit valve	Flare		3.1				61.0					Breakdown
2/11/02													
2/6/02	MHF Alkylation Unit	Leak										Butane	?
2/6/02	FCC Regenerator flange	Leak		6.4								14 tons catalyst	Breakdown
1/24/02													
12/18/01		Vacuum hearing & catalytic hydro-desulfurization unit		5.2				2,999.1					Variance granted
11/30/01													
11/28/01													
11/8/01													
11/6/01	Blower Motor & VFD	Bypass Stacks		18.0				12,600.0				Requ'd obtain RECLAIM credits	Maintenance Variance
10/25/01	Alkylantion Unit	Valve stem lek		288.0				2.4				Possible HF emissions	Variance denied
10/16/01													
10/10/01	Fulfur Plant cooler	Leak		0.4		1.6							Breakdown
10/6/01													
10/5/01													
8/2/01	Hydrotreater Fractionator Tower	Heaters		456.0				89.3				Excess emissions were offset at facility	Maintenance Variance
7/3/01													
6/29/01													
6/23/01	Power bumps - sour water stripper, compressor, SCRs, CO boiler	Flaring										NO _x & SO _x	Breakdown

Exxon Mobil SCAQMD, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/10/01													
5/17/01													
4/26/01													
4/12/01	Hydrocracker unit compressor	Leak	20+										Breakdown
4/4/01	SRU Fuel Gas Regulator											No excess emissions	Breakdown
3/28/01	Thermal oxidizer												Invalid breakdown (NOV)
3/13/01													
3/6/01	SRU sulfur CEMS												Not a breakdown
2/18/01													
2/13/01	FCCU CO boiler fan	Boiler stack	20+										Breakdown
2/8/01	Alkylation Unit	Leak							2,500.0				Breakdown
2/7/01													
2/5/01	Incinerators serving wastewater separators			0.4					8.0				Breakdown
2/4/01													
2/3/01													
2/2/01													
1/31/01													
1/29/01													
1/28/01													
1/20/01													
1/17/01													
1/15/01													
1/13/01													
1/5/01													

APPENDIX C

Georgia Upset Rules

Upset Rules: EPA has approved into the Georgia SIP an upset exemption that violates the Clean Air Act and EPA's guidance. Georgia's exemption expressly allows excess emissions resulting from startup, shutdown or malfunction of any source "which occur though ordinary diligence is employed."¹ To qualify for this exemption, sources must show "(I) the best operational practices to minimize emissions are adhered to, and (II) all associated air pollution control equipment is operated in a manner consistent with good air pollution control practice for minimizing emissions, and (III) the duration of excess emissions is minimized."² Excess emissions that are caused "entirely or in part by poor maintenance, poor operation, or any other equipment or process failure which may reasonably be prevented" are not covered by the exemption.³

Georgia's exemption does not apply to sources subject to "Alternative Emission Reduction Options" under Georgia's rules or to federal New Source Performance Standards.⁴

The Georgia Center for Law in the Public Interest raised the illegality of Georgia's SIP upset provision in comments on Georgia's Title V program. EPA responded that the upset provision was a SIP issue and should be dealt with outside the Title V process.

In May of 2002, EPA sent Georgia a letter stating:

The current automatic exemption from an emission standard ... is unacceptable. Based on current guidance as articulated in the above [Startup, Shutdown, Malfunction] memorandum and in combination with regulatory requirements governing the Georgia SIP, the proposed regulation

Dr. Samuel Prim, Blakely, GA

The pollution from Georgia Pacific's paper mill affects our health and well being. Upsets from the plant cause pollution that burns our eyes and throats, eats away paint of our cars, and makes our animals sick.

should be reworded to provide that all excess emissions are a violation of the standard and provide for an affirmative defense against an enforcement action if the criteria in paragraph (i) are met.⁵

Despite EPA's letter Georgia's SIP continues to violate the Clean Air Act and EPA guidance.

Reporting: Georgia's upset reporting rules need improvement. Excess upset emissions from a major source lasting four hours or more must be reported with seven days of the upset.⁶ The report must be written and include: (1) the cause of the breakdown, (2) the corrective action taken, and (3) plans to prevent future occurrences. It must be detailed enough to allow the Director to determine if the upset was sudden and unavoidable.⁷

The reports are not required to include the amount of each pollutant emitted. In addition, the fact that upsets lasting less than four hours do not have to be reported is arbitrary. Upsets lasting only a short time can result in significant and toxic emissions.

Data: Due to the inadequacy of Georgia's reporting rules, we did not attempt to obtain specific facility upset data for Georgia facilities.

NOTES

¹ AQC rule 391-3-1-.02(2)(a)(7)(i).

² *Id.*

³ *Id.* at (ii).

⁴ *Id.* at (iii).

⁵ Letter from Kay Prince, Chief Air Planning Branch, EPA Region 4, to Ronald Methier, Chief Air Protection Branch, Environmental Protection Division, Georgia Department of Natural Resources (May 9, 2002).

⁶ AQC rule 391-3-1-.02 (6)(b)(1)(iv).

⁷ *Id.*

APPENDIX D

Louisiana Upset Rules and Data

Upset Rules: Louisiana's SIP includes a variance provision that is clearly illegal. It states if "by reason of exceptional circumstances strict conformity with any provisions of these regulations would cause undue hardship, would be unreasonable, impractical or not feasible under the circumstances, the administrative authority may permit a variance from these regulations."¹ In violation of Clean Air Act section 110, this provision does not require EPA approval before a specific variance can become effective and does not require a demonstration that attainment will be achieved and maintained.

The variance provision violates the Clean Air Act and EPA guidance by exempting emissions from compliance with federal limits. Further, exempted emissions do not have to be caused by a breakdown in technology and do not have to be minimized. Louisiana's rules do provide that variances may not authorize a nuisance or a danger to public health or safety.² Nuisance is defined under Louisiana's SIP as "anything that unlawfully worketh hurt, inconvenience, or damage."³ This provision, however, does not appear to be enforced, as numerous variances are granted for pollution that clearly causes harm to adjacent communities.

In addition to this broad variance provision, Louisiana has numerous rules that exempt facilities from compliance with specific requirements during startup and shutdown. For example, a four hour exemption from some SO₂ limits may be granted during startup or upset if certain conditions are met.⁴ Likewise, sources are exempt from compliance with certain NO_x limits during startup, shutdown or malfunction.⁵

Reporting: Louisiana's current rules require the reporting of all unauthorized emissions that create an "emergency condition" and any other unauthorized emissions that exceed a reportable quantity. Unauthorized emissions creating an emergency condition must be verbally reported within one hour.⁶ Non-emergency unauthorized emissions, which exceed the reportable quantity, must be verbally reported within 24 hours.⁷

In addition, both unauthorized emissions causing emergency conditions and those exceeding the reportable quantity require a written follow up report within seven calendar days of the telephone report.⁸ Written reports must include the date, time and duration of the emissions; the circumstances leading to any emergency condition; the common or scientific name of the chemicals released;

Bazille Williams, Norco, LA

At night when I am at my house around three or four clock in the morning when they let out the emissions and they turn on the flare to burn some of the stuff, all the houses vibrate. Even though I'm in a brick house, all the chandeliers in the house vibrate. My aunt called me up on the phone to see what I could do. I told Shell security—where they have the guards over there—about three o'clock. I told them they have to turn these things off because I can't sleep. Sometimes, because a police officer will go over there, Shell will try to reach me the next day to apologize. But these are things that we are going through. Enough is enough.

Doctors told my wife she had a lung problem and it's all in this atmosphere. We're inhaling all different things. You don't know what's going on around here with the flares and the explosions.

an estimate of the amount released and the method for calculating that amount; remedial actions taken/measures to prevent recurrence; and a determination by the facility whether or not the discharge was preventable.⁹

Louisiana's current SIP includes slightly different reporting rules from those above.¹⁰ The SIP requires facilities to notify the Louisiana Department of Environmental Quality "promptly" of "emergency occurrences or upsets that will substantially increase emissions."¹¹ Immediate telephone notification must be followed by written notification within seven calendar days, giving details of the occurrence and remedial actions. The SIP reporting provisions expressly state "such notification does not imply the administrative authority will automatically grant an exemption to the source(s) of excessive emissions."¹²

Data: We collected data for the seven Louisiana facilities listed below.

Facility Name	Facility Location
Chalmette Refinery	Chalmette, LA
Exxon Mobil Chemical	Baton Rouge, LA
Citgo	Lake Charles, LA
Exxon Mobil Refinery	Baton Rouge, LA
Motiva	Norco, LA
Shell Chemical	Norco, LA
Murphy Oil	Meraux, LA

Excess emissions occurred routinely at these facilities. As the attached spreadsheets show, the seven Louisiana facilities reported releasing an average of 18,017,046 pounds of extra pollution per year during 2001-2002, including 3,467 pounds of benzene and 5,794 pounds of butadiene.¹³

NOTES

¹ 33 LAC: III.917 (A).

² 33 LAC: III.917 (B).

³ 33 LAC: III.111.

⁴ 33 LAC: III.1507.

⁵ 33 LAC: III.2201.

⁶ LAC 33: I.3915.

⁷ LAC 33: I.3917.

⁸ LAC 33: I.3925.

⁹ *Id.*

¹⁰ There is often a time lag between state adoption of rules and EPA's review and approval of those rules into the SIP. EPA has sometimes failed to act on SIP revision requests for years.

¹¹ LA SIP 33:927.

¹² *Id.*

¹³ Where Louisiana facilities reported the release of flammable gas or vapor, we generally assumed that ½ of the total reported was VOCs, unless the report indicated otherwise.

CHALMETTE REFINERY • Chalmette, LA
Emissions Data (Lb./Event): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/30/02	Release	Flare											Startup (after Storm)
9/28/02	Release	Flare										Hydrocarbons, H ₂ S, SO ₂ - no amount specified	Startup (after Storm)
9/27/01	Release	Flare										SO ₂	Malfunction
9/25/02	Sulfur Recovery Unit												Storm preparation
9/12/02	Citizen complaint (nausea, upper respiratory problems, burning eyes)												Maintenance (Turnaround)
9/12/01	Citizen complaint-odor												
9/4/01	Power recovery train											Mixed Hydrocarbons-no amount specified	Malfunction
8/9/01	Pump leak	Pump leak										Butane - no amount identified	Malfunction (Fire)
7/9/01	Floating roof weld	Floating roof										Hydrocarbon - no amount identified	
7/29/01	Citizen Complaint-odor												
6/7/01	Sulfur Recovery Unit	Flare		0.8	14,450	42							Malfunction
6/6/01	Sulfur Recovery Unit	Flare			26,000	75							
6/5/01	Citizen complaint-black soot falling from sky, worse when it rains (testing revealed presence of coke dust)												
6/21/04	FCCU	Flare				3							Malfunction
4/12/02	Citizen complaint-white clouds & odor												
3/27/02	Sulfur plant	Flare											
3/12/01	Hydrocracker feed											VOCs - amt. not identified	Malfunction (Fire)

Chalmette Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/9/02	Tower	Flare			11,200								
11/8/02	No.3 Reformer Catalyst	Flare and Diesel engine compressors		1,248.0	180		560	2,660	220			PM10 - 180	Shutdown/ Maintenance variance
11/25/02	Compressor				1,785								Startup
11/20/02	Release											Propane - no amount specified	
11/12/02	Train 1 Sulfur Plant	Flare			1,560								Shutdown
11/1/02	Sulfur Plant											SO ₂ , H ₂ S	Shutdown
10/29/02	Citizen complaint-odor & respiratory problems												
10/21/02	Citizen complaint-odor												
10/16/01	Sulfur Plant	Flare			15,000	101							
10/11/02	Citizen complaint-odor												Malfunction
12/31/02	SRU train #1	Thermal Oxidizer Stack		216.0	3,940								Shutdown for Maintenance - variance
12/30/02	Catalysts	Flare		1,440.0			40	6	6				Changeout - variance
12/19/02	Tank 200	Tank 200		54.5						69			Maintenance/ Malfunction
12/16/02	Tank 200	Tank 200		24.0						108			Maintenance/ Malfunction
12/11/02	Tank 200	Tank		72.0					653	385			Malfunction
12/4/02	No. 3 Reformer Catalyst	Flare and Diesel engine compressors		1,368.0	300		1,000	4,600	380			PM10 - 340	Shutdown - variance
11/23/02	Compressor	Vent			1,785							SO ₂	Startup
11/22/02	Centrifuge Unit	Unknown		8,760.0					2,640				Sludge Disposal - variance
11/20/02	Propane Line	Bleeder Line										VOCs	Malfunction
11/10/02	release											SO ₂	
11/5/02	Boiler	Flare										Refinery Gas	Shutdown
11/3/02	Sulfur plant					42							
10/31/02	Compressor	Flare										H ₂ S	Shutdown
10/25/02	Waste Gas Compressor	Flare		17.5	8,447								Malfunction (Electrical Outage)

Chalmette Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/16/02	#2 Sulfur Plant	Flare and Thermal Oxidizer		1.4	21,511							H ₂ S - no amount specified	Malfunction
9/27/02	Refinery wide	Flare		42.5	162,000	433			54				Startup (Tropical Storm Isidore)
9/24/02	Refinery wide	Flare		15.7	67,823	181							Shutdown (Tropical Storm Isidore)
9/11/02	Release											Hydrogen flouride - no amount specified	
9/10/02	Pumps, heaters, control valves, and heat exchangers	Flare		1,800.0	700	2	40	6	324,000			PM ₁₀ - 6	Maintenance (Turnaround) - variance
7/19/02	FCCU												Maintenance (Turnaround) - variance
6/30/02	Release											H ₂ S, VOCs	
6/13/02	Flare	Flare		3,240.0	1,800		5,600	6,600	400			PM ₁₀ - 400	Maintenance - variance
5/16/02	Sulfolane	Safety Valve		0.2					28,784				Maintenance
4/9/02	Release											H ₂ S, SO ₂	
3/26/02	Sulfur Recovery Unit	Flare		9.0	359,287	954							Malfunction
2/14/02	#2 Crude Unit	Safety Valve		0.1					26,017				Malfunction
2/5/02	Waste Gas Compressor	Flare		600.0	254,000	60	7,260	1,340	5,720				Maintenance (shutdown) - variance
12/17/01	FCCU and Cat Feed	Flare		17.0	199,061	504							Maintenance
12/13/01	Sweet Crude Minimum Flow Line	Ground							145,412				Malfunction (spill)
12/12/01	Power Outage	Flare		0.1								Hydrocarbons, Sulfur dioxide & Hydrogen sulfide - no amount specified	Unknown
11/9/01	Waste Gas Compressor	Flare		168.0	254,000	60	7,260	1,340	5,720				Maintenance (shutdown) - variance
11/6/01	Natural Gas Line	Flare		17.0		964			4,455			Natural Gas 22,778	Malfunction

Chalmette Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/5/01	Benzene Rundown Line	Benzene Rundown Line		7.0						45			Maintenance
10/22/01	Hydro-desulfurization Unit	Ground		4.5					1,380				Malfunction
9/12/01	Tanks 203 and 38	Tank		1,800.0					27,100				Maintenance - variance
9/2/01	FCCU	FCC Regenerator		0.5					5,717				Malfunction
7/18/01	No.2 Sulfur Train DGA	Flare		0.4	5,345								Malfunction
7/11/01	Tank 200	Tank		144.4						1,089			Malfunction (Corrosion)
7/7/01	FCCU	#2 FCC Regenerator		0.1					3,092				Malfunction
7/6/01	Tank 200	Tank roof leak								1,089			Malfunction (leak)
6/22/01	#2 Coker	Flare		0.5	1,494								Malfunction
6/21/01	FCCU	Flare		0.1		3							Malfunction
6/11/01	Alky Unit	Propane Stripper		5.8					2,415				Malfunction (Corrosion)
6/5/01	Sulfur Recovery Unit	Flare and Thermal Oxidizer		32.0	621,075	1,656							Malfunction
4/9/01	Alky Unit								6			Hydrofluoroic Acid 8, VOCs	Malfunction
3/11/01	Power Outage	Flare and Crude Unit		8.4	68,748	184			4,425				Malfunction (Storm)
TOTALS				21,115.3	2,101,491.0	5,263.2	21,760.0	16,552.0	588,595.9	2,784.9	0.0		
Yrly Avg.				10,557.7	1,050,745.5	2,631.6	10,880.0	8,276.0	294,298.0	1,392.5	0.0		

CITGO • Lake Charles, LA
Emissions Data (Lbs./Event): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/26/02	Unicracker Unit	N/A										SO ₂ , H ₂ S	N/A
12/22/02	Unicracker Unit	N/A										SO ₂ , H ₂ S	N/A
12/12/02	Unicracker Unit	B-12 Flare		0.4	4,132	45			3,199				Malfunction
12/11/02	Complex	N/A										SO ₂ , H ₂ S	N/A
12/8/02	B-12 Flare	B-12 Flare		0.5		0			644			Flammable Gas 1,195	Malfunction
12/7/02	Unicracker Unit	N/A										N/A	N/A
12/6/02	Unicracker Unit	B-12 Flare		10.2	2,027	299			2,328			4432 Flammable Gas	Malfunction
12/3/02	B-12 Flare	B-12 Flare		0.5		0			1,318			Flammable Gas 2,707	Malfunction
12/3/02	F-11 Caustic Wash Drum	F-11 Caustic Wash Drum		4.2					2,525				Malfunction
12/2/02	B-12 Flare	B-12 Flare		0.5		15			1,581			Flammable Gas 2,722	Malfunction
12/2/02	Acid Plant	N/A										N/A	N/A
12/1/02	Unicracker Unit	B-12 Flare		23.7	915	1			291				Startup
11/28/02	A-FCCU	Flare										SO ₂ , H ₂ S	N/A
11/27/02	Unicracker Unit	B-12 Flare		0.4		75			2,275			Flammable Gas 2,749	Malfunction
11/26/02	E-11 Deethanizer	B-8 Flare		0.3	1,951								Malfunction
11/26/02	E-103 Depentanizer	N/A										SO ₂ , H ₂ S	N/A
11/19/02	Tail Gas Compressor	B-11 Flare		0.3	2,231	4			22				Shutdown
11/19/02	Acid Plant	N/A										SO ₂	N/A
11/12/02	B-12 Flare	B-12 Flare		0.3		0			541			Hydrogen 1,088	Malfunction
11/10/02	Acid Plant	N/A										SO ₂ , H ₂ S	N/A
11/3/02	F-2 Fuel Gas Knockout Drum	N/A										SO ₂ , H ₂ S	N/A
11/2/02	Acid Plant	N/A										SO ₂ , H ₂ S	Startup
11/2/02	Coker I Unit	N/A										SO ₂	N/A
10/27/02	B-5 Flare	B-5 Flare										N/A	Malfunction
10/23/02	C-4 Recovery Unit	B-8 Flare		0.7	714								Malfunction
10/13/02	B-12 Flare	B-12 Flare		0.8					3,167				Malfunction
10/7/02	Coker I Unit	N/A										SO ₂ , H ₂ S	Shutdown

Citgo, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/2/02	Refinery Wide			1,440.0	331,710	3,804			11,728			Ammonia 1,479	Tropical Storm
10/2/02	C Sulfur Recovery Unit	N/A										SO ₂ , H ₂ S	Shutdown
9/30/02	Refinery Wide	N/A										SO ₂	N/A
9/18/02	Unicracker Unit	B-12 Flare		34.5	3,526								Malfunction
9/18/02	Propane Line Leak	N/A										VOCs	Malfunction
9/13/02	Tank 21	Ground		96.0								7 barrels kerosene	Spill
9/9/02	Cat Gas Compressor	N/A										N/A	N/A
8/27/02	Unicracker Unit	B-12 Flare		3.0	3,513								Startup
8/20/02	Power/Thermal	B-6 Flare		89.5	1,858								Shutdown
8/16/02	A Topper & A/B Cat Areas	Flare		4.6	5,096								Shutdown
8/13/02	Citizen Complaint-foul odor												Wastewater Treatment System
8/13/02	Citizen Complaint-rotten odor												Wastewater Treatment System
8/7/02	Coker II Unit	B-11 Flare		0.7								SO ₂ , H ₂ S	Malfunction
7/25/02	B 101 Furnace	N/A										SO ₂	N/A
7/25/02	Girbotol Unit	N/A										N/A	N/A
7/24/02	Unicracker Unit	B-12 Flare		12.8	6,081								Malfunction
7/13/02	Leak	Ground										3 barrels Hydrocarbon heavy distillate blend	Spill
7/13/02	Girbotol Unit	Flare										N/A	N/A
7/12/02	C Topper	Flare										N/A	N/A
7/10/02	A Reformer	N/A										N/A	N/A
7/3/02	Acid Plant	N/A										N/A	Startup
6/30/02	Acid Plant	N/A											Startup
6/29/02	Tank 261	Ground										10 barrels diesel oil	Malfunction
6/27/02	B-1 Flare	Flare										VOCs	N/A
6/25/02	K-20 Area	N/A										VOCs	N/A
6/5/02	Acid Plant	N/A										SO ₂	N/A
6/4/02	Cat Feed Hydrotreater	N/A										SO ₂ , H ₂ S	N/A

Citgo, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
5/21/02	C-4 Recovery Unit	Tail Gas Compressor										SO ₂ , H ₂ S	N/A
5/18/02	Complex	Flare										SO ₂ , H ₂ S	N/A
5/8/02	Unicracker	Flare		0.3	2,680								Malfunction
5/5/02	C-4 Recovery Unit	Tail Gas Compressor										SO ₂ , H ₂ S	N/A
4/12/02	Acid Plant	N/A										SO ₂	Startup
4/12/02	Alkylation Unit	Leak										N/A	N/A
4/3/02	A-SRU	B-407 Thermal Oxidizer		13.3	13,485								Startup
3/30/02	JC-36 Compressor	N/A										N/A	Shutdown
3/21/02	Sulften Tail Gas Unit	B-407 Thermal Oxidizer		0.2		131							Shutdown
3/16/02	A-SRU	B-407 Thermal Oxidizer		30.5	4,549								Shutdown
3/15/02	C-Reformer Unit	B-11 Flare										SO ₂ , H ₂ S	N/A
3/15/02	Sulfolane Unit	B-8 Flare										N/A	N/A
3/14/02	Unicracker Unit			720.0	240		760	3,500	280			240 PM ₁₀	
3/8/02	Unicracker Unit	B-12 Flare		0.3	2,680								Shutdown
3/8/02	JC-36 Compressor	N/A										SO ₂ , H ₂ S	Shutdown
3/4/02	Coker II Unit	B-11 Flare		0.7	13,429	145							Malfunction
3/2/02	E-SRU	B-407 Thermal Oxidizer		15.0	16,276								Startup
2/28/02	C-SRU	B-407 Thermal Oxidizer		2.0	5,410								Malfunction
2/28/02	Sulfuric Acid Plant	N/A										SO ₂	Startup
2/26/02	E-SRU	B-407 Thermal Oxidizer		11.3	2,736								Shutdown
2/25/02	C-4 Recovery Unit	B-7 Flare		6.3	2,620								Maintenance
2/21/02	Sulfuric Acid Plant	N/A										N/A	Startup
2/20/02	B-12 Flare	Flare										N/A	Malfunction
2/19/02	Cat Feed Hydrotreater	Flare		0.6								N/A	Malfunction (Storm)
2/19/02	Unicracker Unit	B-12 Flare										N/A	Malfunction
2/13/02	Tail Gas II Unit	Tail Gas II Unit		8.5		104							Malfunction
2/11/02	D-SRU	B-407 Thermal Oxidizer		12.8	16,975								Maintenance/Startup

Citgo, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/7/02	BLCOH	B-8 Flare		7.2	8,743								Startup
2/1/02	Sulfuric Acid Plant	N/A										SO ₂	Startup
1/27/02	B-12 Flare	Flare										VOCs	N/A
1/26/02	Coker I Unit	B-5 Flare		5.9	5,618								Malfunction
1/25/02	D-SRU	B-407 Thermal Oxidizer		3.7	2,800								Maintenance/Shutdown
1/19/02	Coker I Unit	B-5 Flare		1.3	2,200								Malfunction
1/14/02	Process line	Leak										VOCs	Malfunction
1/13/02	Unicracker Unit	B-12 Flare		0.2	1,198								Shutdown
1/11/02	B-12 Flare	Flare		0.0								VOCs	N/A
1/3/02	Central Flare Knockout Drum	Ground		0.7								10 gallons Heavy Gas Oil	Malfunction/Spill
12/27/01	Furnace Tube Leak C-Reformer	Leak										VOCs	Malfunction (leak)
12/22/01	Sulfolane Unit	Leak										VOCs, benzene	N/A
12/12/01	JC-106 Compressor	B-5 Flare		1.2	2,370								Malfunction
12/10/01	Propane Line Leak	Leak										VOCs	N/A
12/8/01	Grease Insert Leak	Leak										VOCs	Malfunction (leak)
12/6/01	Coker I Unit	B-5 Flare		67.0	39,020	379			16,816				Startup
12/6/01	B-5 Flare	Flare										VOCs	N/A
12/4/01	Unicracker Unit	Flare										SO ₂ , H ₂ S	N/A
12/1/01	B-Dock	Barge OMR 1968B										5 gal. high-sulfur diesel fuel	Malfunction/ Spill
11/23/01	Unicracker Unit	B-12 Flare		0.2	2,813								Malfunction
11/21/01	Cit-Con Plant	Leak										VOCs	N/A
11/16/01	Acid Plant	N/A										SO ₂	Startup
11/12/01	C-Fluidized Catalytic Cracker	Bleeder										N/A	N/A
11/10/01	C-SRU	B-407 Thermal Oxidizer		19.5	25,232	135							Startup
11/3/01	C-SRU	B-407 Thermal Oxidizer		112.9	74,038	397							Startup
10/25/01	Alkylation Unit	Tank 91		43.0					64,000				Startup
10/24/01	Alkylation Unit	N/A										Flamable gas	Startup

Citgo, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/14/01	Acid Plant	B-407 Thermal Oxidizer; Acid Plant		3.4	3,016								Startup
10/14/01	Alkylation Unit	Fugitives		61.0					100			VOC emissions at least 100	Leak
10/12/01	Acid Plant	B-407 Thermal Oxidizer; Acid Plant		24.5	28,053	150							Startup
10/10/01	Alkylation Unit	Fugitives		68.0					25,820				Malfunction
10/2/01	Cat Feed Hydrotreater	B-16 Flare		0.5	1,255								Malfunction
10/1/01	Coker	B-11 Flare		5.9	500	100			5,000				Startup
9/21/01	Unicracker Unit	B-11 Flare		356.0	500	100			1,000				Fire
9/21/01	Unicracker Unit	Various		238.3	26,290	285						642 NH ₃	Fire
8/31/01	Coker I Unit	Flare										SO ₂ , H ₂ S	Shutdown
8/9/01	Reformer Distillate Line	Leak										H ₂ S, Butadiene	N/A
7/24/01	Furnace Fire	Duo-Sol N-2A										Selecto phenol, spent caustic	N/A
6/24/01	Acid Plant	N/A										SO ₂	Startup
5/15/01	JC-36 Compressor	Flare										SO ₂ , H ₂ S	N/A
5/9/01	JC-201 Compressor	B-11 Flare		0.4	2,428								Shutdown
4/24/01	C-4 Recovery/ Fluidized Catalytic Cracker	B-5, B-6, B-8 & B-7 Flare		6.0	31,059	193							Malfunction (Power Shutdown)
4/21/01	Sulfolane Unit	Cooling Tower #4		120.0							336		Malfunction (Leak)
4/18/01	Sulfolane Unit	Cooling Tower #4		6.6					1,540	848			Malfunction (Leak)
4/14/01	B-12 Flare	B-12 Flare										SO ₂	N/A
4/4/01	B-11 Flare	Flare										SO ₂ , H ₂ S	N/A
3/15/01	B-8 Flare	B-8 Flare										SO ₂	N/A
2/23/01	Process line	Leak										H ₂ S, VOCs	
2/20/01	Process line	Leak										H ₂ S, VOCs	N/A
2/17/01	JC-51 and JC-59 gas compressor	B-7 Flare		1.2	845								Malfunction
2/10/01	JC-36 Compressor	Relief Valve										SO ₂ , H ₂ S	N/A
2/6/01	A-Topper Unit	Leak										VOCs	N/A

Citgo, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/3/01	C-Fluidized Catalytic Cracker	N/A										N/A	N/A
1/3/01	Unicracker Unit	Flare										SO ₂	N/A
TOTALS				3,699.9	702,812	6,363	760	3,500	144,175	1,184	0		
Yrly Avg.				1,850.0	351,406	3181	380	1750	72,088	592	0		

EXXONMOBIL CHEMICAL • Baton Rouge, LA
Emissions Data (Lbs./Event): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/21/02	Deethanizer steam reboiler	Steam condensate system		26.1					270.0	3.0	32.0		malfunction
12/8/02	Thermal Oxidizer Unit	Not specified		168.0	6,380.0		200	100.00	10.0			H ₂ SO ₄ 680	variance
11/24/02	A-Line Reactor	Safety valve		0.0					592.0			vinyl acetate 208 lbs	malfunction
10/15/02	D-Line production facilites	Source 01-95										methanol 200 lbs, vinyl trimethoxysilane <200 lbs	extension of 5/24/02 variance
10/1/02	Gas Turbine Generator, Heat Recovery Steam Generator, Duct Burner	Not specified		120.0			52,284.0	49,704.00					variance
9/28/02	F-6 Thermal Oxidizer	Not specified		0.3								maleic anhydride phthalic anhydride & VOCs	variance
9/25/02	Turbine Generator	Not specified		1.6			15,200.0						variance
9/13/02	Maintrain Ethylene Unit	UP-03 B pump		0.1					59.0	11.0	9.0	other VOC's 39 lbs	malfunction
9/11/02	F-6 Thermal Oxidizer	S-70		0.5								maleic anhydride , phthalic anhydride & VOCs	malfunction
9/7/02	Halobutyl polymerization unit	Safety valve		0.1					11,200.0				malfunction
9/1/02	Turbine Generator	Not specified							<200				variance
8/27/02	F-6 Thermal Oxidizer	Not specified		2.0								maleic anhydride & VOCs	shutdown
8/22/02	F-6 Thermal Oxidizer	Not specified		3.0								maleic anhydride, VOCs	malfunction
8/20/02	Polyolefins plant-Recycle isobutane compressors	leak in 3/4" line		0.3					502.0			isobutane	malfunction
8/1/02	#1 MOX Boiler	S-33		12.0			166.8						variance
7/9/02	2 Light Ends Unit Absorber tower, Entergy booster gas compressor; Refinery Gas Recovery Unit	Refinery flare system			3,501.0			135.00	22,578.0	13.0	17.0		malfunction

ExxonMobil Chemical, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/28/02	Temporary drum, sample points and feed pump	Not specified							44.4				extension of 4/20/02 variance
6/27/02	Maintrain Ethylene Unit	OLA-2X Steam Cracking Furnace		4.5					10,372.0				malfunction
6/18/02	E-line reactor	Safety valve		0.4					15,680.0			vinyl acetate	malfunction
6/15/02	OLA-1X Gas Turbine	Not specified		15.0			100.0	100.00					variance
6/3/02	F-5 Thermal Oxidizer	F-6 Thermal Oxidizer		6.9				yes-amount not specified				maleic anyhydride, phthalic anhydride, and other VOC's amounts not specified	malfunction
5/29/02	Ethylene Maintrain Unit	Plantwide flare system	smoke	42.7	4,258.0	11.0	6.0	5,179.00	14,030.0	91.0	585.0		malfunction
5/24/02	D-Line production facilites	Source 01-95										methanol 200 lbs, vinyl trimethoxysilane <200 lbs	variance
5/21/02	OLA-1X Gas Turbine	S-04		15.0			100.0	100.00					variance
5/20/02	Elastomers Unit	Agitator seal		19.2					4,000.0				startup
5/13/02	D-Line production facilites	Source 01-95		721,740.0					<.2				variance
5/2/02	Hot Oil Furnace	Not specified		144.0								Incresed CO, Nox & VOC rate	variance
4/20/02	Temporary drum, sample points and feed pump	Not specified		2,160.0					44.4				variance
4/10/02	Diolefin Extraction Unit	Actrene additive tote							20.0				variance
4/10/02	OXO Tankcar and Tankcar loading racks	Not specified							2.0				variance
4/9/02	OXO Unit	OXO Burner line		2.0		0.2	13,306.0		14,183.0			H2 877 lbs,	malfunction
4/9/02	Partial Oxidation Unit	Leaky pressure control valve		16.0					44,140.0			synthetic gas 44140 lbs	malfunction
4/8/02	#25 flare pilot	pilots		0.2					188.0				malfunction
4/8/02	OXO Unit	OXO Burner line		14.0		0.2	41,410.0						malfunction
3/21/02	E-line reactor	Safety valve		0.1					10,000.0			flamable gas >1000 lbs	malfunction

ExxonMobil Chemical, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
3/1/02	Tanks MVTk08 and MVTk09	T-MVo8, T-MVo9		168.0					4.0				variance
2/13/02	Maintrain Unit	Unspecified transfer line							26.0	12.0	14.0	polynuclear aromatic hydrocarbons	malfunction
2/9/02	E-line reactor	Safety valve		0.2					1,100.0				malfunction
2/6/02	Polyolefins plant	Knockout vessel, flare system	smoke	0.6					100.0			isobutane	malfunction
2/5/02	Ethylene Maintrain Unit	Plantwide flare system	smoke	47.9	11,420.0	58.0	458.0	12,379.00	32,074.0	171.0	825.0		malfunction
2/5/02	Propylene Compressor	Unspecified flare							5,100.0			isoprene	malfunction
1/2/02	OXO Tankfield Vapor Recovery System			120.0					5,220.0			VOC's include 240 lbs n-Hexane	malfunction
12/30/01	Halobutyl polymerization unit	#25 flare		2.9					14.5			HCl, MeCl n-hexane isobutane, isoprene, isobutylene	malfunction
12/9/01	B-line recycle sysytem	Safety valve		0.0					2,117.0			vinyl acetate	malfunction
11/23/01	Halobutyl polymerization unit	#25 Flare		1.2					41.0				malfunction
11/7/01	MVTk08 and MVTk09 storage tanks	T-MVo8, T-MVo9		2,196.0					6.0				variance
10/26/01	Unspecified 3/4" line	Hole in line		0.5								synthetic gas 100-150 lbs	Malfunction
10/19/01	Unspecified pump	Unspecified pump seal		0.1					27.0	27.0			malfunction
10/12/01	Maintrain Unit	G-Furnace effluent transfer line		0.1					155.8	1.1	0.5		malfunction
10/10/01	Wet Naptha tank	Wet Naptha tank		504.0		<0.2		900.00	20.0	20.0		H ₂ SO ₄ <.2 lbs	variance
10/1/01	OXO Alcohol Unit	temporary recycling equipment		744.0					260.0	0.2		n-hexane	variance
9/25/01	Halobutyl polymerization unit	Fugitive emissions from piping and vent from seal drum							2,320.0			n-hexane	variance
9/15/01	Gas Turbine NG-01	S-9		50.0								increased CO rate	variance

ExxonMobil Chemical, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/1/01	OXO Tankfield Vapor Recovery System	Not specified		72.0					3,120.0			n-hexane	shutdown - variance
8/16/01	CgX Compressor Level Displacer	Not specified		0.1								synthetic gas 1600 lbs	malfunction
8/5/01	Not specified	Unspecified gasket							2.0			polyaromatic hydrocarbon	malfunction
7/23/01	Wastewater improvement Unit	Wastewater improvement unit							93.0				maintenance
7/8/01	Vistalon Polymerization Unit			0.0					8,900.0			n-hexane 4700 lbs, other VOC's including hexane isomers, propylene, propane and ethylene 4200 lbs.	malfunction
6/8/01	F-5 Thermal Oxidizer	Not specified		0.6					285.0			maleic anhydride, phthalic anhydride	malfunction
5/11/01	Diels-Alder Reactor Unit	Not specified		0.4					126.0		30.0	toluene	malfunction
5/6/01	Gas turbine generator unit	Not specified		72.0								increased rate CO, VOC, NOx	variance
5/2/01	F-300 Furnace	flue gas stack		1.0			11.7						malfunction
5/1/01	Halobutyl polymerization unit	Not specified		24.0								Cl ₂ 30 lbs	variance
4/27/01	PSLA-1 Unit	T-282		1.2					158.0	1.8			
4/21/01	ACLA Unit	Loading rack chiller										MEK 8.32 lbs	malfunction
4/19/01	F-635 furnace	Not specified		72.0								VOC & CO	variance
4/10/01	Refinery gas collection unit	Flare		2.0	786.0								malfunction
3/14/01	Vistalon Polymerization Unit	Safety release valve		0.0					950.0			n-hexane cyclohexane other C6 Isomers	malfunction/ operator error
2/9/01	C-Line Reactor	Safety release valve		0.2					5,825.0				malfunction
2/8/01	Isopropyl alcohol Unit	Vapor recovery system		336.0								VOCs	variance
2/8/01	C-Line Reactor	Safety release valve		0.3					8,600.0				malfunction

ExxonMobil Chemical, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/1/01	Ethylene Maintrain Unit	process vessels and associated piping		240.0								ammonia <700 lbs	variance/letter of no objection
1/27/01	Vistalon Polymerization Unit	Fugitive emissions in transfer to tanker truck storage		168.0					60.0			n-hexane	variance
1/16/01	Lion Unit Cobalt reactor	Lion Unit Cobalt reactor		2.3				10.70	<100				malfunction
1/13/01	B-Line Reactor system	Safety valve		0.0					595.0			vinyl acetate	malfunction
1/2/01	PALA Unit; F-6 Thermal oxidizer	PALA Unit; F-6 Thermal oxidizer		0.4					275.3				malfunction
Totals				729,341.5	26,345.0	69.4	123,242.5	68,607.70	225,489.4	351.1	1,512.5		
Yrly Avg.				364,670.7	13,172.5	34.7	61,621.3	34,303.85	112,744.7	175.5	756.3		

EXXONMOBIL REFINERY • Baton Rouge, LA
Emissions Data (Lbs./Event): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/22/02	#4 Lights End Unit-West	Safety valve		0.6		1,700			73,640	280	60		Malfunction
1/22/02	Absorber Tower Pump	Pressure relief valve			4,000	1,000			101,250	750	500		Malfunction
1/13/02	Alkylation Plant W. Train Reactor Section	Fire		1.5								Hydrocarbon vapor (butylenes, butanes, isopentane)	Turnaround
12/18/01	PSLA-10 (fire)	N/A										N/A	N/A
12/3/01	Sulfur Recovery Units	MOV-179 / incinerator		21.0	9,192								Maintenance (equipment check)
10/26/01	T-4 Drier Regeneration Gas Scrubber	Safety valve		0.0					1,000			Flammable Vapor 1,000	Startup
10/5/01	N/A	Flare										N/A	N/A
8/17/01	Coker Complex	Flare		0.3	1,117	3				0			Malfunction
8/2/01	Hydrocracker Unit	Flare		3.4	900								Maintenance
8/2/01	CO Furnace (PCLA-2)	PCLA-2		0.3	707		11,795					PM - 126	Maintenance (equip testing)
7/26/01	Fluidized Catalytic Cracking Unit	PCLA-2, flare		23.2	14,493		66,622					PM - 5,409	Malfunction
7/8/01	Ruptured Well Water Line	PCLA-2 reactor, 4LEU West Tail Debutanizer Tower, flare		53.3	29,433	309	83,520		27,742	11		PM - 7,460	Malfunction
6/19/01	Fluidized Catalytic Cracking Unit	PCLA-2 cat reactor		0.3					180			Flammable Vapor 180 Polynuclear Aromatics 72	Startup
6/18/01	Fluidized Catalytic Cracking Unit	PCLA-2		72.0	60,000		522,000					PM - 36,000	Startup - variance
6/14/01	# 4 Lights End Unit	Safety valve		1.6		187			7,983	30			Malfunction
3/30/01	Management of Molton Sulfur			8,784.0		520							Variance
3/26/01	CO Furnaces	PCLA-2, PCLA-3		816.0	2,088,000		17,864,000					PM - 982,000	Maintenance - variance
3/3/01	#2 Reforming Unit	Fire										N/A	N/A
2/25/01	#5 Lights End	#5 Lights End		212.0					4,600			Flammable Vapor 4,600	Malfunction

ExxonMobil Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/5/01	Sour Water Leak	Leak				20						Ammonia 11.3	N/A
TOTALS				17,027.9	2,871,207	6,445	26,762,009	326,107	245,556	1,133	577		
Yrly Avg.				8,514.0	1,435,604	3,223	13,381,005	163,054	122,778	567	289		

MOTIVA • Norco, LA
Emissions Data (Lbs./Event): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/13/02	Spent catalyst riser	RCCU flare		26.4	4,932.0		2,714.2	498.8	1,243.0	10*		PM 55	malfunction
11/30/02		Coker unit											malfunction
11/21/02	BB splitter column	RCCU flare		1.0			3.8	0.7	5.0			PM-10 .13	variance
11/15/02	Pressure vessel sphere	West Ops Ground Flare		96.0	0.0		1,080.0	200.0	1,400.0				variance
11/14/02	Switch room	Coker flare		1.7	1,512.0			12.5	96.5	4.1	0.0	"cyclohexane"	
PM "	malfunction												
11/13/02	Dual stream analyzers	Dual stream analyzers							1,020.0				variance
11/12/02	Diesel pump	Diesel pump		1,080.0	120.0		400.0	1,840.0	140.0			"PM; toluene xylenes formaldehyde acetaldehyde acrolein naphthalene PAH"	variance
11/1/02	RCCU flare	RCCU flare		0.1	40.7			4.7	2.6				malfunction
11/1/02	Portable diesel powered pump	Portable diesel powered pump						203.0					malfunction
11/1/02	Vacuum flasher waste gas compressor	RCCU flare	smoke	0.1	40.7			4.7	2.6				malfunction
10/20/02	Tank pv-122	Tank pv-122											malfunction
10/17/02	CR-1 pitstop	CR-1 pitstop and diesel driven generator		480.0	180.0		600.0	2,800.0	220.0			"PM; toluene; xylenes; formaldehyde acetaldehyde acrolein naphthalene PAH"	variance
10/8/02	Distillation unit	Distillation unit		0.7	0.2				0.2				malfunction
10/8/02	Second stage main fractioner	Second stage main fractioner	smoke	0.1		4.8				6.8		39,934.9 pounds of 'Nonflammable liquid'	malfunction
10/5/02	Sour water stripper	Sour water stripper		2.5	94.7								malfunction
10/3/02	RCCU Wet Gas Compressor	RCCU flare		2.2	4,337.0	2.0	2,048.0	377.0	1,092.0		0.2	PM 41	malfunction
9/26/02	Temporary diesel equipment	Temporary diesel equipment		235.2	40.1		130.6	605.9	48.3			PM 43	malfunction
9/6/02	Furnace f53	Furnace f53		144.0	380.0		1,400.0	5,900.0	16,460.0				variance

Motiva, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/6/02	Tank cleaning	Diesel fired compressor		120.0	40.0		140.0	660.0	60.0			"PM-10; toluene xylenes; formaldehyde; acetaldehyde acrolein; naphthalene PAH"	variance
9/3/02	Coker jet pump	Wet gas compressor		4.1	4,629.9			57.4	13.9	2.5	0.1	cyclohexane	malfunction
9/3/02	Coker feed heater and coker charge heater	Coker feed heater and coker charge heater		336.0	360.0		1,940.0	4,680.0	540.0				variance
8/7/02	Diesel driven air compressors	Diesel driven air compressors		1,600.0	180.0		560.0	2,580.0	200.0			PM-10 180	variance
7/27/02	RCCU refrigeration compressor	RCCU flare		1.0	64.2			3.6	19.6				malfunction
7/27/02	RCCU compressor	Flare		1.0	64.2			3.6	19.6				malfunction
7/26/02	Loading hatch on barge	Loading hatch on barge										spent caustic	malfunction
7/25/02	RCCU	Flare		19.0	1,021.6								startup
7/21/02	RCCU unit	RCCU flare		76.8	1,731.0		2,365.0	152.0	692.0	0.0			malfunction
6/25/02	Disulfide seperator	RCCU flare		161.3	1,028.7	356.4			4,131.6	0.0		n-Hexane	malfunction
6/22/02	Disulfide seperator	Disulfide seperator		0.0					8.8	0.0		n-hexane	malfunction
6/21/02	Main fractioner	RCCU flare		39.8	1,509.6			85.6	920.3				malfunction
6/18/02	Tank 481	Tank 481		2.5					67.2	1.5			malfunction
6/10/02	CO Heater	CO Heater		240.0			44,680.0	84,680.0					testing
6/8/02	Hydrocracker Unit	S2 incinerator		1.0	182.7								malfunction
5/21/02	Diesel fired pump	Diesel fired pump		1,224.0	1,660.0		5,380.0	25,040.0	2,000.0				variance
5/9/02	Disulfide seperator	Disulfide seperator		8.3					8.8	0.0			malfunction
5/2/02	Shell Chemical Boiler	RCCU flare	smoke	0.2	35.4		35.0	2.0	20.8				malfunction
4/19/02	Sulphur Plant 3	RCCU flare		6.0	316.0			18.0	92.0	0.0			malfunction
4/15/02	Furnace tube	Furnace tube		168.0	300.0		1,020.0	4,680.0	380.0			PM-10 660	variance
4/10/02	Tank 479	Tank 479		21.5					24.3	0.0		flammable gas	malfunction
3/6/02	Flare gas compressor	Flare		48.0	3,000.0								maintenance
3/4/02	Hydrocracker Unit	Hydrocracker Unit		0.5								hydrogen 4656 methane 1595 steam 39030	malfunction

Motiva, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/11/02	Hydrogen compressors	Coker Flare		4.6	0.0	1.0		0.0	0.0				malfunction
2/3/02	Naphtha heater treater and catalyst regeneration unit turnaround	Naphtha heater treater and catalyst regeneration unit turnaround		336.0	740.0		1,680.0	7,720.0	1,080.0			PM 540	variance
1/28/02	CR-2 unit pitstop	CR-2 unit pitstop		480.0	60.0	20.0	460.0	1,300.0	3,800.0	100.0			variance
1/28/02	HCU pitstop	HCU pitstop		480.0	1,180.0		1,560.0	6,480.0	6,040.0				variance
1/28/02	H2 pitstop	H2 pitstop		480.0	340.0		1,200.0	5,200.0	860.0				variance
1/10/02	Alkylation unit	Alkylation unit		0.4				1.0	243.0			flammable gas 229	startup
1/8/02	Diesel generator	Diesel generator		24.0	20.0		60.0	280.0	20.0	0.1	0.0		variance
1/7/02	Coker wet gas compressor	Flare		1.1	2,070.0	1.1		38.1	13.5	0.0			malfunction
1/7/02	MOV	HCU flare		14.0				0.0	1,037.0	7.3		flammable gas 973.5	malfunction
12/14/01	Stripper liquid tops line	Stripper liquid tops line							636.6	32.3		flammable gas 510;n-hexane; Toluene .3	malfunction
12/9/01	Gasoline blender metering loop	Gasoline blender metering loop		1.8					1,506.5	190.0		xylene ; flammable gas 1121.5	malfunction
11/25/01	Disulfide seperator	Disulfide seperator		0.1					8.8	0.0			malfunction
10/24/01	Wet gas compressor	RCCU flare		12.2	80.0	0.0		4.3	5.0				malfunction
10/23/01	Coker pitstop/ DU5 Pitstop	Coker pitstop/DU5 Pitstop		1,056.0	820.0		2,800.0	12,460.0	1,120.0				variance
10/19/01	Diesel fired water pumps	Diesel fired water pumps		8.0	10.0		40.0	140.0	20.0	0.0			variance
10/9/01	Air liquide	RCCU flare		0.8				11.0	8.9				malfunction
9/19/01		RCCU flare				1.3			243.0	2.5	0.5		malfunction
9/17/01				0.1	0.0	0.1			248.0	3.0		Xylene; flammable gas 238.5	malfunction
9/9/01	Flue gas scrubber	CO heater		10.7	1,115.5								malfunction
9/6/01	Diesel driven air compressors	Diesel driven air compressors		1,488.0	920.0		3,000.0	13,940.0	960.0			PM 1000	variance
9/6/01	Naphtha hydrotreater unit	Coker Flare		3.0	288.0			0.0	0.0				malfunction
8/27/01	Diesel fired electric generators	Diesel fired electric generators		840.0	7,473.5		8,809.1	92,405.8	12.3	7.2			variance
8/27/01	BB splitter column	RCCU flare		0.3				5.6	4.6				malfunction

Motiva, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
8/13/01	Storage tank F433	Storage tank F433							1,000.0			Benzene, Toluene, Ethyl Benzene, Xylene, and flammable gas	malfunction
8/8/01	Heat exchanger	Heat exchanger		3.8					103.0	2.0		flammable gas 103	malfunction
7/31/01	Disulfide seperator	Disulfide seperator		59.2								flammable gas	malfunction
7/26/01	Coker F-125	2 diesel fired water pumps		192.0	200.0		640.0	2,980.0	240.0				variance
7/26/01	Pressure vessel sphere	West ops ground flare		48.0			66.0	80.0	800.0		800.0		variance
7/25/01	Disulfide seperator	Disulfide seperator		0.1									startup
7/16/01	Disulfide seperator	RCCU flare		48.5	780.0			44.0	593.5	0.2	33.0	flammable gas 354	malfunction
6/12/01	Substation FT3	Diesel generator		336.0	1,820.0		1,240.0	5,400.0	160.0				variance
6/12/01	Vacuum flasher	Vacuum flasher				1.0			49.0				malfunction
6/11/01	Multiple	Multiple		240.0	2,147.0		0.5	41.3	35.9	0.0	0.0		malfunction
5/22/01		Control valve		0.0					20.4	0.3	0.1	flammable gas 20	malfunction
5/12/01		HCU		11.8				0.0					malfunction
5/12/01		HCU		6.8				0.0					malfunction
5/12/01	Coker unit	Coker unit		0.0	272.0				975.0	14.0		flammable gas 961	malfunction
5/9/01	Off-line coke drum	Coker unit		0.1					191.0			flammable gas 191	malfunction
5/7/01	Alky vent tower	Alky vent tower		3.7					459.0			Flammable Gas 459	malfunction
5/7/01	Alky vent tower	Alky vent tower		2.3					459.0			flammable gas 459	malfunction
4/25/01								0.0	8.8			flammable gas	malfunction
4/22/01		Coker unit										hydrogen (flammable gas) 2	malfunction
4/17/01		Coker unit							39.0			flammable gas 382	malfunction
4/16/01		Hydrocracking Unit										hydrogen (flammable gas)	malfunction
4/13/01	Second stage recycle compressor	First stage charge pump		0.3	225.0				15.6			flammable gas 7	malfunction
4/1/01	RCCU main air blower	RCCU flare		47.8	828.0	0.1		246.0	859.0	0.0			malfunction
3/28/01	Methanator reactor	High temperature shift reactor		0.4					1,176.0			flammable gas 1176	malfunction
3/27/01	Butadiene sphere	West ops ground flare		48.0			60.0	80.0	800.0			PM 795.024	variance

Motiva, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
3/23/01	Diesel fired air compressor	Diesel fired air compressor		466.7	540.0		1,760.0	8,180.0	780.0			PM 580.08	variance
3/9/01	Hydrocracker Flare	Hydrocracker Flare			0.0							SO2	startup
3/7/01	Disulfide seperator	Disulfide seperator		0.6								disulfide unk	malfunction
3/7/01	Disulfide seperator	Disulfide seperator		0.0								flammable gas	malfunction
3/4/01	Marine vapor recovery unit	Marine vapor recovery unit											malfunction
3/3/01	Cat cracker	Vent		2.3					509.0			flamable gas 509	
3/3/01	disulfide seperator	Disulfide seperator		0.5									malfunction
2/24/01	Off-line coke drum	Off-line coke drum		0.1					285.5			flammable gas 285.5	malfunction
2/20/01	West ops elevated and west ops ground flares	RCCU flare			40.0		1,040.0	14,400.0	13,620.0				variance
2/14/01	Hydrocracker flare	Hydrocracker flare, main fractioner column		86.7	402.2	0.0		0.0	596.9	0.0	0.0	flammable gas 568	malfunction
Totals				12,995.3	50,171.9	387.9	88,912.2	306,526.7	72,571.7	373.9	833.9		
Yrly Avg.				6,497.6	25,085.9	193.9	44,456.1	153,263.3	36,285.8	187.0	416.9		

MURPHY OIL • Meraux, LA
Emissions Data (Lbs./Event): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/27/02	#2 FCCU	#2 FCC Esp Stack		3					900			2700 Catalyst	Shutdown
12/24/02	#1 SRU TGT	#1 Sulfur Plant Stack		480	552								Malfunction
12/17/02	#1 FCCU Gas Con	North Flare	smoke	1,080	3,636								Shutdown
12/13/02	Sour Gas Compressor DHT	North Flare		120	2,024								Shutdown
11/29/02	#2 SRU TGT	#2 Sulfur Plant Stack		1,785	3,640								Malfunction
11/26/02	#2 FCC Wet Gas Compressor	North Flare		90	465								Shutdown
11/25/02	#2 FCC West Gas Compressor	North Flare	smoke	180	996								Maintenance
11/23/02	#1 FCC	#1 FCC Regenerator Stack		3								1500 Catalyst	Malfunction
11/20/02	#1 SRU	North Flare		60	2,951								Malfunction
11/13/02	#1 SRU/ #1 TGT	North Flare		360	7,083								Malfunction
11/12/02	Sour Gas Compressor DHT	North Flare		150	5,836								Shutdown
10/17/02	#2 FCC Wet Gas Compressor	Fugitives		1,500		2			450				Malfunction
8/19/02	#2 FCCU	#2 FCC Stack		28								500 Catalyst	Malfunction
8/9/02	#1 FCCU Compressor	North Flare		534	721								Malfunction
7/29/02	#1 SRU TGT	#1 Sulfur Plant Stack		120	74								Malfunction
7/25/02	#1 SRU TGT	#1 TGT Stack		60	37								Startup
7/15/02	Sour Gas Compressor DHT	North Flare		390	3,647								Shutdown
7/8/02	#1 Incinerator Stack	Stack	smoke	4,320	100								
7/7/02	#2 SRU TGT	#2 Sulfur Plant Stack		45	65								Shutdown
7/6/02	#1 SRU		smoke		200								
7/1/02	#2 FCCU	#2 FCCU Stack	smoke	3					2,667			800 Catalyst	Malfunction
6/19/02	#1 SRU TGT	#1 Sulfur Plant Stack; North Stack		60	41								Malfunction
6/18/02	#2 FCCU	#2 FCCU Stack	smoke	3					1,971			900 Catalyst	Shutdown

Murphy Oil, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/18/02	#2 SRU TGT	#2 Sulfur Plant Stack		105	3,489								Startup
6/18/02	#2 SRU TGT	#2 Sulfur Plant Stack		330	22,465	54							Shutdown
6/17/02	#1 FCCU	#1 FCC Regenerator Stack		17								1071 Catalyst	Startup
6/9/02	#1 FCCU	#1 FCCU Stack		5								315 Catalyst	Startup
6/9/02	#1 FCCU	#1 FCCU Stack	smoke	3					2,367			2664 Catalyst	Shutdown
6/6/02	#2 FCCU		smoke	180								Hydrocarbons	Malfunction (fire)
6/4/02	#2 FCCU	#2 FCCU Stack	smoke	1					107			32 Catalyst	Malfunction
5/29/02	#2 SRU/ SWS	#2 SRU Stack; North Flare		270	1,537								Startup
5/14/02	Citizen Complaint oil substance on car												
5/11/02	#1 FCCU Regenerator	Regenerator Stack										amt. SO ₂ not specified	
5/8/02	Tank 200-4	Tank 200-4		2,160					316				Spill
5/1/02	Citizen Complaint 4 loud booms	Compressor											Startup
4/22/02	#1 FCCU Gas Con.	North Flare		1,395	4,706								Shutdown
4/19/02	#2 FCCU	#2 FCCU Stack		1					2,031			300 Catalyst	Malfunction
4/18/02	#2 FCCU	#2 FCCU Stack		5					13,540			2000 Catalyst	Malfunction
4/17/02	#2 FCCU	North Flare		720	5,316								Shutdown
4/5/02	#1 FCCU Gas Con	North Flare		975	3,398								Shutdown
3/28/02	#1 FCC Air Blower	#1 FCC Stack		17					8,238			4195 FCC Catalyst	Shutdown
3/15/02	#1 FCC Gas Con Interstage	North Flare		510	1,717								Shutdown
3/14/02	Unicracker Unit			20,160	240		760	3,500	280			240 PM ₁₀	Variance
2/28/02	#2 FCCU	North Flare		120	33								Malfunction
2/13/02	#2 TGT	#2 TGT Stack		540	1,089								Startup
2/11/02	Citizen Complaint smells like burning rubber	Cat Cracker											Malfunction
2/9/02	Total Refinery	North Flare		90	1,328								Startup
2/8/02	#2 Cat	#2 Cat Regenerator Stack	smoke	75					2,267			500 Catalyst	Shutdown
2/2/02	#2 TGT	#2 Plant Stack; North Flare		210	2,851								Shutdown

Murphy Oil, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/2/02	Refinery	North Flare		90	1,328								Planned Maintenance
1/23/02	#1 Cat	Fugitives; Cat Stack		5								290 Slurry Oil	Shutdown
1/23/02	#1 Cat	Fugitives; Cat Stack		1								2000 Catalyst	Shutdown
1/10/02	Spill	Batture										4 barrels Diesel and Red dye to atmosphere	Malfunction (spill)
1/8/02	#1 Cat	#1 Cat Regenerator Stack		2								3000 Catalyst	Shutdown
1/7/02	#1 Cat	#1 Cat Regenerator Stack		2								3000 Catalyst	Startup
12/22/01	Total Refinery	Flare; FCCU	smoke	1,380	19,996							2008 Catalyst	Shutdown
12/12/01	#1/#2 FCCU	Flare; Cat Stacks	smoke	1,620	36,893				9,309			2200 FCCU Catalyst	Shutdown
12/12/01	Citizen Complaint (3) black smoke												
11/15/01	#1 Cat	#1 Cat Regenerator Stack		25,920			322,704						Malfunction
11/9/01	#1 TGT	#1 Cat		510	368								Malfunction
11/2/01	#1 Cat	Flare		210	785								Malfunction
11/1/01	Wet Gas Compressor	Fire											Malfunction
10/26/01	#1 FCCU	#1 Cat Regenerator Stack		15								2000 Catalyst	Startup
10/24/01	#1 FCCU	Flares		750	2,150								Startup
10/16/01	#1 FCCU	#1 Cat Regenerator Stack		20								1000 FCCU Catalyst	Malfunction
10/6/01	#1 TGT	#1 TGT Stack		300	167								Malfunction
10/1/01	#2 FCCU	Fugitive (FCCU)		60								10,000 Slurry Oil	Malfunction
10/1/01	Citizen Complaint bad odor and yellow cloud												
9/11/01	#1 Cat	#1 Cat Regenerator Stack	smoke	7					4,740			500 Catalyst	Malfunction
7/10/01	TGT				21								
6/24/01	Amine Turnaround	Heaters & Stack		5,760	108,000								Maintenance
6/22/01	Wastewater Treatment Plant			216,000	1,860		2,180	15,060	1,080			1000 PM10	Variance

Murphy Oil, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/12/01	Sour Gas Compressor DHT	Flare		75	1,181								Malfunction
5/20/01	#2 FCCU	37,247	smoke	105	415								Malfunction
5/11/01	#1 FCCU	#1 Cat Regenerator Stack		1,440	1,377								Malfunction
4/21/01	#2 TGT	#2 TGT Stack		60	158								Malfunction
4/12/01	Spill	Loading Slab										20-100 gallons of Scalfuel	Malfunction (spill)
4/10/01	#2 TGT	#2 TGT Stack		90	264								Malfunction
3/31/01	Amine Exchanger	Process Heaters and Boilers		660	223								Malfunction
3/21/01	#1 FCCU	Flare	smoke	1,212	4,088								Malfunction
3/21/01	Diesel Air Compressors	Compressor		120,960	1,820		5,920	27,500	1,900			1960 PM10	Maintenance - variance
3/15/01	#1 FCCU	#1 Cat Regenerator Stack		15								500 Catalyst & FCCU Feed	Malfunction
3/12/01	#1 FCCU	Flare	smoke	1,800	3,829								Shutdown
2/2/01	#2 SRU TGT	Flare; SRU stack		120	451								Malfunction
1/10/01	#1 Cat	Flare	smoke	945	3,081								Malfunction
1/8/01	#1 Cat	Flare	smoke	840	2,739								Malfunction
TOTALS				420,237	271,431	56	331,564	46,060	52,163	0	0		
Yrly Avg.				210,119	135,716	28	165,782	23,030	26,082	0	0		

SHELL CHEMICAL • Norco, LA
Emissions Data (Lbs./Event): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/13/02	Motiva's RCCU Unit	GO-1 Elevated flare	smoke	3.4	4,923.0			127.0	41.0			Hexane	startup
12/12/02	de-ethanizer column	OL-5 Ground flare, OL-5 Elevated flare		3.1				303.0	234.0				malfunction
12/7/02	Hydrate drum level controller	OL-5 Gournd flare, OL-5 Elevated flare		3.0				546.0	433.0				malfunction
12/6/02	Unspecified re-boilers	OL-5 Ground flare, OL-5 Elevated flare		0.3				55.0	52.0				malfunction
12/3/02	Debut column	OL-5 Groung flare, OL-5 Elevated flare		1.0				169.0	143.0				malfunction
11/18/02	UUnspecified furnace line	Leaky line		Not Specified					28.0	1.0	1.0	Flamable gas 25 lbs	malfunction
11/17/02	OL-5 demethanizer reboiler	OL-5 Ground flare, OL-5 Elevated flare		4.6				889.0	1,605.0				malfunction
11/13/02	OL-5 Unit	OL-5 Ground flare, OL-5 Elevated flare		1.0				73.0	58.0				malfunction
11/9/02	OL-5 Unit	OL-5 Ground flare, OL-5 elevated flare		4.2				846.0	670.0				malfunction
11/8/02	Unspecified tank	Tank seal		Not specified						Yes-amount not specified		Napthalene, Xylene	malfunction
11/1/02	Motiva's DU-5 unit	Utilities East flare		7.9	802.0			9.0					malfunction
10/15/02	DEA column	GO-1 Elevated flare		49.7	16,413.0			502.0	316.0			Hexane	malfunction (off spec)
9/26/02	Hurricane, Flooding of East Site	OL-5 Ground flare, OL-5 Elevated flare, Utilities East flare		347.3	19,691.0		15.0	28,746.0	106,874.0	10.0	2,103.0	Hexane	shutdown and restart
9/21/02	RCCU	Flare		7.6	228.0		2.0	190.0	58.0			Hexane	shutdown
9/3/02	OL-5 Unit	OL-5 Ground Flare, OL-5 Elevated Flare	smoke	36.0				12,226.0	47,431.0	163.0	4,029.0		malfunction
8/28/02	OL-5 depropanizer column	OL-5 Ground flare, OL-5 Elevated flare		1.3				203.0	161.0				malfunction
8/12/02	OL-5 Unit	OL-5 Ground flare, OL-5 Elevated flare		1.7				306.0	289.0				malfunction
8/7/02	GO-1 Unit	GO-1 Elevated flare		4.0				30.0	10.0			Hexane	malfunction
7/24/02	Motiva's RCCU Unit	GO-1 Elevated flare		9.0			6.0	561.0	167.0			Hexane	startup
7/23/02	OL-5	Flare		0.7				123.0	123.0				malfunction

Shell Chemical, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
7/22/02	Motiva's RCCU Unit	GO-1 Elevated flare		15.0	18,753.0		7.0	573.0	185.0			Hexane	malfunction
7/8/02	Motiva DU-5 unit Compressor X-1876	Utilites East flare		15.4	7,878.0			88.2					malfunction
6/25/02	Motiva's RCCU Unit	GO-1 Elevated flare		17.7	22,691.0		9.0	743.0	238.0			Hexane	malfunction
6/23/02	Motiva's RCCU Unit	GO-1 Elevated flare		3.7	5,693.0		2.0	174.0	56.0			Hexane	malfunction
6/21/02	OL-5 furnace	OL-5 Ground flare, OL-5 Elevated flare		2.5				411.0	343.0				malfunction
5/13/02	OP-1 piping, OL-5	OL-5 Ground flare, OL-5 Elevated flare		0.1				701.0	641.0				malfunction (flaring off spec)
5/12/02	S-3 DEA Stripper reboiler	GO-1 Elevated flare		2.7	6,568.0				24.0			Hexane	malfunction
5/7/02	GO-1 Unit Ethylene splitter column	GO-1 Elevated flare			3.0			329.0	615.0				malfunction
5/1/02	OL-5 Cooling fan	OL-5 Ground flare, OL-5 Elevated flare		1.0				85.0	67.0				malfunction
4/19/02	50# Steam header at Sulfur Plant 3	GO-1 Elevated flare		4.5	13,275.0		5.0	405.0	130.0			Hexane	malfunction
4/17/02	OL-5 Unit	OL-5 Ground flare, OL-5 Elevated flare		9.2				1,621.0	1,321.0				malfunction
4/14/02	OL-5 depropanizer column	OL-5 Ground flare, OL-5 Elevated flare		2.0				378.0	328.0				malfunction
3/18/02	Not Specified	Not Specified		46.5				188.0					not specified
3/6/02	Compressor K-1879 at Motiva Distilling Unit DU-5	Utilites East flare		35.5	150.9			192.8	1,653.3	6.0		Hexane	malfunction
2/15/02	Not Specified	OL-5 Ground flare, OL-5 Elevated flare		1.0				18.9	14.9				Not specified
1/31/02	Natural gas line	Pipe leak										Natural gas 1000 lbs	malfunction
1/3/02	OL-5 processed gas compressor	OL-5 Ground flare, OL-5 Elevated flare						224.0	165.0		3.0		malfunction
11/3/01	OL-5 processed gas compressor	OL-5 Elevated flare, OL-5 Ground flare	smoke	25.2			2.2	8,394.0	17,830.0	2.2	156.7		malfunction
11/1/01	DHT Compressor	OL-5 Ground flare		168.0			4,040.0	740.0	2,620.0			Particulate matter 140 lbs.	variance

Shell Chemical, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/15/01	CUS	OL-5 Ground flare, OL-5 Elevated flare	smoke	20.1				6,677.0	15,650.0		66.0		malfunction
10/11/01	Not Specified	GO-1 Elevated flare		13.8				332.0	238.0		71.9		malfunction
10/6/01	column	GO-1 Elevated flare		3.9				101.0	93.7		21.7		not specified
10/5/01	Olefin Unit	unspecified flare	smoke									Methane, amt not specified	malfunction
10/5/01	GO-1 unit	GO-1 Elevated flare	smoke	13.7	204.0		2.0	918.0	3,586.0	55.0	225.0		malfunction
10/4/01	GO-1 unit	GO-1 Elevated flare	smoke	33.3									startup
10/3/01	East site	Not Specified		Not Specified					7.0			Flammable gas 7	not specified
10/1/01		Bleeder Valve										Styrene, benzene, toluene, xylene (no amt given)	
9/29/01	Shell Norco, East Site, furnace	Not Specified		Not Specified					500.0			Flamable gas 500	startup
9/12/01	GO-1	Go-1 flare	smoke	167.8									shutdown
9/11/01	DHT vent gas compressor	OL-5 Elevated flare		2.7	316.0			21.0	23.0				malfunction
9/10/01	Ethylene Unit	Ground Spill							<3	<2	<1		shutdown
9/9/01	Cat Cracker	Not Specified		Not Specified	1,200.0								malfunction
9/7/01		GO-1 flare	smoke	154.8									shutdown
8/22/01	OL-5	OL-5 Ground flare, OL-5 Elevated flare		3.0				528.0	447.0				malfunction
8/13/01	Tank F-433	Tank F-433 roof drain system		21.5					2,626.0	60.0		Toluene, xylene	malfunction
8/1/01	GO-1, OL-5	OL-5 Ground flare, OL-5 Elevated flare		1.0				195.0	588.0				malfunction
7/31/01	Not Specified	Not Specified		Not Specified						yes-amount unspecified		Toluene, xylene, ethylbenzene, styrene, 1-3 cyclopentadiene amounts unspecified	Not Specified
7/16/01	Dry gas from Motiva off-spec on SO ₂	GO-1 Elevated flare		6.0	16,604.0			507.0	149.0				malfunction

Shell Chemical, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/11/01	Power failure at Entergy Substation 2 > power outage affected OL-5, GO-1, BD-5, and Utilites East Units	Utilites East flare, OL-5 Ground flare, OL-5 Elevated flare, GO-1 Elevated flare	smoke	423.0	23,019.1		6.8	19,031.6	32,292.8	67.0	222.9	Hexane	malfunction
6/9/01	Alkylate RVP Analyzer	P-1190/1192 pipeline leak		3.0					750.0			Flamable gas 750	malfunction
6/7/01	GO-1 Furnace	Decoking pot		0.7					1,653.0	312.0	229.0	Flamable gas 5142.5	malfunction
6/7/01	DEA treater	GO-1 Elevated flare		12.7	32,079.0			980.0	290.0				malfunction
6/6/01	M-unit Butylene Reactor	M-unit piping		0.8					907.5			Flamable gas - 907.5	malfunction
6/1/01	Shell Norco, East Site	GO-1 Elevated flare, West Ops Ground flare		73.5	1,353.0				21,954.0	417.0	1,517.0	Toluene	
6/1/01	Not Specified	Not Specified		Not Specified						7.5			not specified
6/1/01	Marathon in Garryville sent dry gas that was off spec on Hydrogen Sulfide	GO-1 Elevated flare		1.6	5.0			31.0	8.0				shutdown
4/14/01	OP-1 Furnace	GO-1 Elevated flare, West Ops Ground flare		7.8	99.0			411.0	266.0	2.0	2.0		startup
4/13/01	South GO-1 depropanizer control valve	GO-1 Elevated flare, GO-1 Ground flare		3.8	8.6			192.0	136.5		0.0		malfunction
4/1/01	Motiva RCCU Unit	GO-1 Elevated flare		4.4	4,303.0			74.0	1,879.0				startup
3/31/01	Vent Gas Compressor at Motiva's DHT	Shell OL-5 Gound flare		1.0	405.8			7.9	6.2				malfunction
3/3/01	level transmitter on OL-5 process gas compressor	OL-5 Ground Flare, OL-5 Elevated Flare		14.3				2,704.0	2,551.0	0.0	5.1		malfunction
2/24/01	Offline coke drum PV-914	Relief Valve RV-1271		0.1					285.5			Flamable gas 285.5	malfunction
2/12/01	Dry gas from Marathon off spec on SO ₂	GO-1 Elevated flare		10.2	116.0			146.0	108.0				malfunction
1/25/01	OP-1 Unit	GO-1 Elevated flare	smoke	10.7			1.0	491.0	356.0	1.0	3.0		startup

Shell Chemical, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/21/01	OP-1 deethanizer reboiler	GO-1 Elevated flare		5.5				82.0	59.0	2.0	8.0		shutdown
1/15/01	GO-1 process unit	GO-1 Elevated flare		6.8	7.6			40.0	31.0				malfunction
Totals				1,856.9	196,789.0	0.0	4,098.0	94,639.4	272,365.5	1,105.8	8,664.3		
Yrly Avg.				928.4	98,394.5	0.0	2,049.0	47,319.7	136,182.7	552.9	4,332.2		

APPENDIX E

Ohio Upset Rules and Data

Upset Rules: Ohio's regulations do not provide an exemption or affirmative defense for upsets, startups or shutdowns. The Ohio Environmental Protection Agency may exercise its enforcement discretion in deciding whether or not to take an enforcement action for exceedances.

Ohio's rules, however, do include a variance provision. One version of this variance is approved into the Ohio SIP, while another version is included in Ohio's regulations. Under both versions, new variances from SIP requirements cannot become effective until they are approved by EPA.¹ Renewals of those variances, however, do not require EPA approval.² This appears to violate Clean Air Act section 110. Under Ohio's current variance rule (but not the SIP approved version of the rule) variances are prohibited for "new facilities," which are defined as any source the construction or modification of which is commenced on or after February 15, 1972.³ This provision seems to significantly limit the number of facilities that could qualify for a variance. According to Ohio EPA, no variance has been granted in the past ten years.

In addition, Ohio's rules generally require facilities to shut down air pollution sources during scheduled maintenance of air pollution equipment that requires the shutdown or bypassing of such equipment.⁴ Sources may request, however, and receive approval to shutdown or bypass of air pollution control equipment without the shutdown of associated air pollution sources during maintenance.⁵ According to Ohio EPA, this provision does not excuse any excess emissions that occur during the maintenance.

Reporting: Ohio's implementation of its reporting requirements needs significant improvement. The regulations require

Shirley Jacobs, Oregon, OH*

“Never really thinking about any hazards, assuming that the EPA are monitoring this factory and I found out that wasn't the case. . . Sun was required to monitor themselves and how much they were or were not putting out as far as letting the public know, I have no idea about. . . After doing a lot of homework, Anita and I both found out that there were many leakages way above and beyond what was going on, . . . I developed breast cancer, had to have a mastectomy and developed of course chemical sensitivity, very closely related to petroleum-based products. . . Even today, I find that I'm still having medical problems, thyroid being one of them, of course the chemical sensitivity, fatigue. . .

* worked directly across the street from the Sunoco refinery. She now lives in New Jersey.

maintenance that will necessitate the shutdown of air pollution control equipment to be reported at least two weeks prior to the planned shutdown if the source intends to operate while controls are shut down.⁶ The report must include the estimated quantity of emissions likely to occur during the shutdown.⁷

In addition, Ohio requires "immediate" notification by phone, fax or email of any malfunction that results in illegal excess emissions.⁸ This notification must include the nature and estimated quantity of air contaminants. If the malfunction lasts more than 72 hours, the permittee must also submit a written statement within two weeks of the date the malfunction occurred and must, within two months, submit a plan for preventing, detecting and correcting similar failures or breakdowns of equipment.⁹

Finally, recent amendments to OAC §3745-77 require Title V permittees to

include in reports all excess emissions, including excess malfunction emissions. These reports, however, are not required to include estimates of emissions.

Data: We reviewed files for the facilities listed below. We were unable, however, to obtain reliable data regarding the total emissions during upsets from these facilities, because the files appeared incomplete. Only 1/3 of the reports we found in the files actually quantified upset emissions. Many of the other reports either identified only the pollutant released, or failed to include any description of the emissions during the upset.

Facility Name	Facility Location
Degussa	Belpre, OH
Chevron Phillips	Marietta, OH
Kraton Polymers	Belpre, OH
Globe Metallurgical	Beverly, OH
BP Amoco - Solvay Chemicals	Marietta, OH
Nova	Belpre, OH
Premcor	Lima, OH
BP	Toledo, OH
Sun	Toledo, OH
Marathon Ashland	Canton, OH

Furthermore, the files for some of the facilities included only a handful of reported upsets. A number of files contained only a few emails. The attached sample spreadsheet for Premcor's Lima facility includes more information than was available for most Ohio facilities, yet still illustrates the lack of data in Ohio's files.

While we did not total upsets for Ohio facilities, due to the lack of data, the reports we reviewed did indicate that upsets are causing significant pollution in Ohio. Sun's Toledo facility appeared to be somewhat diligent about reporting

excess emissions of SO₂. The chart below includes just a few of the large emissions reported by Sun's Toledo facility.

SAMPLE SUNOCO RELEASES

Date	Amount Released
1/8/01	1,700 lbs. propane
5/22/01	1800 lbs. SO ₂
6/15/01	1025 lbs. SO ₂
7/1/01	36,388 lbs. SO ₂
9/22/01	97,100 lbs. SO ₂
10/16/01	29,803 lbs SO ₂
3/4/02	42,960 lbs. SO ₂
5/20/02	95,250 lbs. hydrocarbons
5/28/02	9,510 lbs. hydrocarbons
7/29/02	96,300 lbs. hydrocarbons
8/12/02	411,600 lbs. butane
11/2/02	12,883 lbs. SO ₂

Sun's reports, however, rarely included pollutants other than SO₂. Given the emissions reported from other refineries around the country, it is hard to believe that Sun does not emit significant excess quantities of CO and VOCs. A few of Sunoco's reports did identify emissions of "mixed hydrocarbons," but most of those reports listed the quantity as unknown.

NOTES

¹ OAC §3745-35-03.

² *Id.*

³ OAC §3745-15-01.

⁴ OAC §3745-15-06(A)(2).

⁵ OAC §3745-15-06(A)(3).

⁶ OAC §3745-15-06(A).

⁷ *Id.*

⁸ OAC §3745-15-06(B).

⁹ *Id.*

PREMCOR • Lima,OH
Emissions Data (Lbs./Event): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/30/02		CO Boiler bypass stack			11,760								
12/28/02		FCC flare, LIU flare, acid gas flare, Coker blowdown stack		46.4	35,980			347					
12/12/02		LIU flare		1.3				44					
12/10/02		FCC flare		4.5	12,551			173					
12/3/02	SRU	SRU incinerator stack		10.2		844							
11/27/02		LIU flare		0.4				35					
11/21/02		LIU flare		4.7				130					
10/16/02		LIU flare		0.3				19					
12/12/01		SRU flare		1.3	1,278								
9/14/01		SRU flare		0.4	2,912								
8/5/01		SRU flare		0.1	546								
7/26/01	Railcar	leaky foot valve of railcar		2.3						48			
7/10/01		East Flare		24.9	13,000								
5/12/01		Acid gas flare		0.5	3,200								
3/11/01	East Side heaters & boilers	LIU flare and ESP & East side heaters and boilers		504.1	608,000								
2/14/01	CE Boiler & Furnace	CE Boiler & Coker Furnace		2.2	4,000								
2/10/01	CE Boiler & Furnace	CE Boiler & Coker Furnace		4.9	9,000								

APPENDIX F

Pennsylvania Upset Rules and Data

Upset Rules: The Pennsylvania Department of Environmental Protection (PADEP) has rules that apply to most of the state. PADEP had delegated authority over air programs in certain areas to the Philadelphia Department of Public Health and the Allegheny County Health Department. Neither PADEP's rules, nor those of the Philadelphia Department of Public Health or Allegheny County Health Department, contain a SIP exemption or affirmative defense for upset emissions.

Reporting: Pennsylvania's Title V rules require the reporting of deviations, including those attributable to upset conditions, within the time required by the permit. Deviation reports are generally required to include the probable cause of the deviations and corrective actions or preventive measures taken.¹ The rules do not require that the reports include an estimation of excess emissions caused by the deviation.

Philadelphia Air Management Services' rules require the reporting of breakdowns, malfunctions or emergencies which may increase emissions "immediately" by telephone with a written confirmation within 24 hours.² In addition, the rules provide: "where it is planned to take any approved installation, equipment, or device out of service for any reason, except for normal plant shutdowns, the Department shall be notified at least three days in advance."³

Allegheny County Health District rules similarly require breakdowns of equipment causing excess emissions or emissions of toxics to be reported within one hour and to be followed by written notice within seven days.⁴ The notice must specify the materials emitted and

their estimated quantity. It must also include a statement regarding the toxic qualities of the emissions.⁵ Planned shutdowns of control equipment must be reported at least 24 hours before the shutdown.⁶ The reports must include the nature and quantity of likely emissions.⁷ Any shutdown of control equipment without the shutdown of associated processes requires approval of the Department.⁸

Data: We reviewed upset reports for the following two facilities:

Facility Name	Facility Location
Sunoco Philadelphia Refinery	Philadelphia, PA
Sunoco Marcus Hook Refinery	Marcus Hook, PA

For Sunoco's Philadelphia refinery, we reviewed Philadelphia Air Management Services' 24 hour Notifications and Release Incident Reports. For Sunoco's Marcus Hook facility, we reviewed Hazardous Material Release Notification

Sarah Kurnes, Philadelphia PA, near Sunoco Refinery

“Once I was a healthy, robust person, but now after living near the Sunoco refinery I am unable to do normal every day things. To live in pain everyday is not what anyone should have to endure. When the facility has an upset, I can see the pollution cloud moving towards my home. The pollution forces me out of my own home and neighborhood, and has sent me to the hospital numerous times unable to breathe. I could sum up my experience in one sentence, “It’s a living hell.”

Reports and Incident Notifications in the files at the Pennsylvania Department of Environmental Protection.

As can be seen from the attached Sunoco spreadsheet, it was not possible to determine from these files how much was being emitted by the Sunoco facilities during upsets. The “24 Hour Notification to Air Management Services” reports filed by Sunoco’s Philadelphia refinery include a section for the environmental impact of the event, but the response in this section rarely included emission estimates.

The Release Reports and Incident Notifications filed by Sunoco’s Marcus Hook facility did include some emissions estimates, but not a reliable estimate of

total upset emissions. The reports did indicate, however, significant SO₂ emissions throughout 2002 due to repeated problems with the Ethylene Complex.

NOTES

¹ 25 PA CODE §127.511(c)(2).

² PAMS Reg. I, Section II.A.5.

³ *Id.*

⁴ ACHD §2108.01(c).

⁵ *Id.*

⁶ ACHD §2108.01(b).

⁷ *Id.*

⁸ *Id.*

SUNOCO REFINERY • PHILADELPHIA, PA
EMISSIONS DATA (LBS./EVENT): 1.01.01 – 12.31.02

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/13/02	1332 Reformer	Flare	~possible high flaring										Start-up
12/13/02	868 FCCU	Flare		0.5								ethane, propane, butane	Malfunction
12/8/02	1332 Reformer												Shutdown
12/7/02	865 & 866 Units												H2 compressors shut down due to high level in KO drum
12/7/02	865 & 866 Units												Start-up of H2
12/2/02	433 HF Unit	Flare	high flaring										Shutdown for turnaround
11/18/02	868 FCCU	Flare											Start-up after maintenance turnaround
10/26/02	13H1 Vacuum Tower Heater	Burner											Fire
10/26/02	#2 Boiler at 22 Boiler House												Start-up of 600# steam boiler
10/21/02	North Yard Propane Flare	Flare											Shutdown
10/21/02	210 B & C												Start-up
10/21/02	#2 Boiler at 22 Boiler House												Shutdown
10/16/02	860 Reformer											hydrocarbons	Regenerating the 860 catalyst
10/12/02	864 Unifiner												Start-up
10/12/02	860 Reformer												Start-up
10/6/02	210 B & C												Shutdown
10/6/02	860 & 864 Units												Shutdown
10/3/02	868 FCCU												Shutdown
9/28/02	866 12 P-1B Charge Pump	Pump											Fire
9/9/02	868 FCCU	Stack	opacity >20	1.5								catalyst fines	Malfunction
8/22/02	866 Unit												Start-up

Sunoco Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _X	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
8/16/02	867 Sulfur Plant			1.0									Unit upset due to back pressure caused by blockage
8/15/02	867 Sulfur Plant	Flare											Both N & S plants shut down, which caused exceeding limit on N flare
8/15/02	210 Crude Unit												Start-up
8/15/02	860 Reformer												Start-up
8/13/02	867 Sulfur Plant	Flare											Both N & S plants shut down, which caused exceeding limit on N flare
8/12/02	864 Unifiner												Start-up
8/12/02	860 Reformer												Start-up
8/12/02	867 Sulfur Plant	Flare											Both N & S plants shut down, which caused exceeding limit on N flare
8/10/02	210 A & B Crude Units												Shutdown due to small leak in fuel gas drum
8/10/02	867 N Sulfur Plant	Flare											Both N & S plants shut down, which caused exceeding limit on N flare
8/9/02	867 N Sulfur Plant	Flare											Both N & S plants shut down, which caused exceeding limit on N flare
8/7/02	NE Refining Complex	Flare		192.0	157,200								
8/7/02	867 Sulfur Plant	Flare											Shutdown
8/6/02	#2H ₉ Boiler at 860 Unit												Start-up
8/6/02	231 Gulfiner Unit												Start-up
8/6/02	#2H ₉ Boiler at 860 Unit												Test run to check instrumentation
7/30/02	866 Unit												Start-up after hot standby
7/25/02	867 Sulfur Plant	Stack		1.0									
7/25/02	North Claus Unit			15.0									High backpressure

Sunoco Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
7/24/02	867 Sulfur Plant	Stack											Malfunction
7/11/02	867 Sulfur Plant	Burner		2.0									Leak malfunction
7/3/02	1733 Cumene												Start-up
6/18/02	NE Refining Complex	Flare		0.8	1,974								
6/4/02	231 Gulfiner Unit	Tower											Shutdown for repairs
5/28/02	868 FCCU	Stack	~opacity >20%	0.1									Start-up
5/23/02	1732 Udex Unit												Start-up
4/21/02	1232 CO Boiler	Tube											Leak malfunction
4/21/02	8733 FCCU						possible high emission						Going to total combustion
4/19/02	860 Reformer	Flare	~possible high flaring										Start-up
4/17/02	869 DIB Tower	Flare		0.2									Malfunction
4/17/02	860 Reformer	Tower	smoke										Fire
4/17/02	862 Unit	Reboiler										propane, butane dissipated with steam	Leak malfunction
4/14/02	867 Sulfur Plant	Line					over report-able quantity					DEA (exceeded as well)	Leak malfunction
4/8/02	#3 Boiler House	Stack	smoke	0.1									Malfunction
3/25/02	1232 FCCU	Flare	smoke	0.5									Instrumentation problem produced high flaring
3/6/02	#3 Broiler	Stack	smoke	0.2									Steam load increase
3/3/02	868, 865 FCCU	Flare	high flaring										Power Outage
2/24/02	1232 FCCU	Flare	~possible opacity										Start-up
2/23/02	1232 FCCU	Flare	~possible opacity										Start-up
2/22/02	1232 FCCU	Flare	~possible opacity										Start-up

Sunoco Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/21/02	1232 Unit												Lost feed to unit, shutdown
2/13/02	1332 Reformer	Flare											Start-up
2/9/02	1232 CO Boiler		~possible opacity										Start-up
2/9/02	1732 Udex Unit	Flare											Start-up
2/7/02	1733 Cumene												Start-up preparation after turnaround
2/4/02	231 Gulfiner Unit	Flare											Start-up
2/4/02	Tank 884											crude	Malfunction
1/30/02	868 FCCU	Flare	~possible opacity										Restart
1/27/02	#1 Boiler tubes												Malfunction: tubes damaged on restart
1/26/02	1232 Unit			0.0								PP mix	Gauge malfunction
1/22/02	868 FCCU	Flare	~possible opacity										Shutdown
1/19/02	868 FCCU	Flare	~possible opacity										Start-up
1/18/02	868 FCCU												Shutdown to cool disengager
1/16/02	868 FCCU	Catalytic Cracker											Start-up
12/23/01	210 Crude Unit												Shutdown
12/23/01	#3 Boiler at 22 Boiler House	Flare	flaring, smoke										Malfunction
12/20/01	#4 Water Treatment Plant	Tank		3.5								160 lbs of Cl ₂	Accident
12/20/01	868 FCCU	Flare	~possible opacity spikes										Start-up
12/6/01	1232 FCCU		~possible opacity										Problems necessitating shutdown and restart
12/5/01	860 Reformer												Start-up
11/27/01	860 Reformer												Shutdown to repair H ₂ leak
11/20/01	1332 Reformer												Start-up

Sunoco Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO2	H2S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/18/01	HDS 866	Flare	~possible flaring										Heating up unit for start-up
11/12/01	1332 Reformer												Malfunction
10/19/01	HDS 866												Shutdown
10/19/01	868 FCCU												Start-up
10/16/01	231 Gulfiner Unit												Start-up
10/14/01	1232 FCCU	Flare	heavy flaring	0.3									Malfunction
10/13/01	868 FCCU	Stack	exceeded opacity	1.0									Valve start-up
10/13/01	868 FCCU		opacity spike									catalyst fines	Shutdown
10/13/01	231 Gulfiner Unit												Shutdown
9/27/01	531 Unit	1232 absorber off gas pipe				higher levels will be in the fuel gas system as a result							Malfunction
9/12/01	867 Incinerator Stack	Stack		1.0									SO2 excursion
8/30/01	1232 Unit	Tower										hydrocarbons	Malfunction
8/26/01	1232 Regenerator		~possible opacity spikes									catalyst fines	Start-up
8/25/01	1232 CO Boiler		high opacity										Maintenance
8/23/01	1232 FCCU C-101B Blower	Stack										catalyst fines	Start-up
8/10/01	860 Reformer, 864 Unifiner												Start-up
8/5/01	1232 FCCU												Shutdown
8/1/01	1232 FCCU			7.0									
7/31/01	#40 Boiler at #3 Boilerhouse	Stack	smoke	0.1									Maintenance
7/21/01	860 Reformer, 864 Unifiner												Shutdown
6/29/01	#2 Boiler at 22 Boiler House		smoke	0.3									Shutdown and restart
6/27/01	1332 Reformer												Start-up
6/22/01	1332 Reformer												Start-up

Sunoco Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/20/01	8733 Sour Water Stripper												Shutdown
6/18/01	NE Refining Complex	Sulfur recovery unit		0.8	1,974								Malfunction
6/18/01	1232 CO Boiler	#4 soot blower	opacity ~71%	2.0								catalyst fines	Start-up
6/18/01	8733 Sour Water Stripper	Tower											Shutdown
6/18/01	1232 CO Boiler	#4 soot blower	high opacity	1.0								catalyst fines	Start-up
6/18/01	137 Crude Unit	Heater	smoke (heavy)	0.2									Malfunction
6/11/01	NE Refining Complex	Sulfur recovery unit		3.8	10,593								Malfunction
6/11/01	867 Sulfur Plant	Tail gas unit											Start-up
6/11/01	867 Sulfur Plant	Tail gas unit											Malfunction
6/11/01	1332 Reformer												Shutdown
6/6/01	1332 Reformer	Cooling tower										hydrocarbons	Malfunction
5/27/01	862 Light Ends Unit	Flare											Repairs to depropanizer put tower back in service
5/26/01	862 Light Ends Unit	Flare											Deprop reflux pump shut down due to malfunction
5/22/01	"This is a drill"											hydrofluoric acid, <50 gal	
5/20/01	Depropanizer Reflux Pump	Flare	some smoke, high flaring										Failed pump with no backup caused emissions
5/20/01	868 FCCU	Stack	opacity exceeded	5.0									Start-up
5/18/01	868 FCCU	Stack	opacity spikes; exceeded opacity	5.0									Spikes during shutdown, 5 hrs during start-up
5/17/01	868 FCCU	Flare											Start-up
5/17/01	433 Alkylation Unit												Start-up
5/16/01	433 Alkylation Unit												Shutdown
5/13/01	865 Unit												Start-up

Sunoco Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
5/12/01	86o Reformer, 864 Unifiner, & 866 Unit												Start-up
5/11/01	86o Reformer												Shutdown
5/10/01	868 FCCU		opacity exceeded 60%, 20%	0.1									Shutdown
5/10/01	865 Unit			0.0								H ₂	Malfunction
4/20/01	1232 CO Boiler	Sootblower										soot	#3 sootblower operated after repair
4/15/01	86o Reformer		smoke	1.0									Fire
4/15/01	Exchangers 2E5C 1,2,3											NaPh	Fire
4/3/01	1232 FCCU		~possible high opacity										Round of power off mapping to improve performance
4/2/01	Flue Gas Boilers		elevated opacity										Injected walnut shells into flue gas boilers to improve efficiency
3/31/01	1232 FCCU												Start-up
3/30/01	1232 FCCU											3-5 BBLS of fresh feed	Shutdown
3/29/01	1232 Unit	Tower										ethane, methane	Malfunction
3/29/01	1232 FCCU												Start-up
3/28/01	1232 CO Boiler	Flare	~possible flaring										Shutdown
3/27/01	231 Gulfiner Unit												Start-up
3/21/01	137 Crude Unit												Shutdown for decoking
3/7/01	1232 CO Boiler	Stack										catalyst fines	Maintenance
3/4/01	Belmont Terminal: Air to City Sewer	Fan											Car accident damaged pollution control device
2/27/01	862 Light Ends Unit		light flaring; flames controlled with steam										Shutdown for turnaround

Sunoco Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/27/01	HF 433												Shutdown for repairs
2/26/01	865 Unit	Valve										hydrocarbons	Safety valve release
2/25/01	433 Alkylation Unit												Start-up
2/5/01	862 Unit	Flare	high flaring, no smoke										Malfunction
1/30/01	Tank SR73	Valve										iso-butane	Crack in valve
1/23/01	SRTF Butane Spheres	Sphere											Compressor malfunction
1/19/01	433 Alkylation Unit												Flare unit out of service
1/17/01	868 FCCU	Stack	Some opacity										Start-up
1/17/01	868 FCCU		>20%	11.0		>200 PPA (?) for 2 hrs							
1/16/01	868 FCCU		~possible exceeding opacity										Malfunction
1/16/01	433 Alkylation Unit	Flare	high flaring										Depressurizing in prep for turnaround
1/9/01	CRU 1332	Prefrac column											Pressure surge led to release
1/7/01	1332 Reformer												Start-up
1/1/01	433 Alkylation Unit	Flare	high flaring										Malfunction
1/1/01	433 Alkylation Unit												Start-up

APPENDIX C

Texas SIP Upset Rules and Data

Upset Rules: As part of a Notice of Deficiency for Texas' Title V program, EPA informed Texas that its upset rules were illegal and had to be amended. Texas responded by adopting new upset rules in January of 2004. EPA has published proposed approval of the rules, but has not yet issued a final approval. Texas' new rules, which are currently effective in the state, provide an affirmative defense to penalties for excess emissions resulting from upsets and unscheduled startup, shutdown and maintenance that meet certain requirements.¹

The rules state that *scheduled* maintenance, startup and shutdown emissions, however, do not have to be included in Texas' air permits if certain conditions are met.² The rules do include the following provision:

Subsection (c) and (e) of this section do not remove any obligations to comply with any other existing permit, rule or order provisions that are applicable to a scheduled maintenance, startup, or shutdown activity, including complying with any federal permitting requirements.³

This provision should be interpreted to require, at a minimum, that all scheduled startup, shutdown and maintenance be included in federal permits and that any exceedances of federal permit emission limits during scheduled startup, shutdown and maintenance constitute violations. Any interpretation which exempts such emissions from federal permitting or enforcement would violate the Clean Air Act and EPA's guidance.⁴

Texas' new rules include a sunset provision which makes them automatically expire in June 2005. Texas has indicated that it will adopt revised rules before the current rules expire. EPA should

participate actively in Texas' rulemaking process to ensure that any the new rules conform to federal law and EPA's policy and that any problems with the rules are flagged early in the process.

Reporting: Texas requires all excess emissions exceeding a reportable quantity to be reported within 24 hours of discovery. The notification must include the duration of the event, the pollutants emitted in amounts exceeding the reportable quantity, the total quantities emitted, and the authorized emission limits for those pollutants. A final report must be filed within two weeks and must include the methodology used to calculate the quantities emitted and the permit number or rule citation for the emission limits that apply to the facility.⁵

The reporting provisions of Texas' rules are not subject to the sunset provision and will not expire in June 2005.

Suzie Canales, Corpus Christi, TX

“The communities along Refinery Row are plagued with horrific odors that can permeate homes and become trapped inside as well as bright flares that light up the sky in the middle of the night.

During our patrols at Refinery Row in the middle of the night we see numerous bright flares that are massive in size and that emit tons of pollutants. We see stacks that relentlessly spew particulate matter over communities. And we see trailer parks and homes adjacent to the refineries with their lights out for the night. People have a basic right to feel secure and safe, especially while they sleep. But it's this time, in the cover of darkness and when people are most vulnerable, that refinery and chemical plants willfully blast the unsuspecting community with deadly chemicals.”

Data: Data collected from the Texas Emission Event database for the following facilities is attached.⁶ Every effort was made to include only final reports, although it appears that some companies were submitting changes to their online reports well after the two week deadline.

Facility Name	Facility Location
Blalock Booster Station	Garden City, TX
SACROC CO ₂ Plant	Snyder, TX
Welch CO ₂ Gas Processing	Welch, TX
Boyd Compressor Station	San Angelo, TX
Goldsmith Gas Plant	Goldsmith, TX
Wasson CO ₂ Plant	Denver City, TX
BASF	Port Arthur, TX
BP Texas City Plant B	Texas City, TX
Dow Freeport	Freeport, TX
Equistar	Channelview TX
Equistar	La Porte, TX
Equistar Chocolate Bayou	Alvin, TX
Exxon Baytown Chemical	Baytown, TX
Exxon Baytown Olefins	Baytown, TX
Huntsman Port Neches	Port Neches, TX
Huntsman Petrochemical	Odessa, TX
Sid Richardson Carbon	Borger, TX
Atofina	Port Arthur, TX
BP Products North America	Texas City, TX
Citgo Corpus East	Corpus Christi, TX
Exxon Baytown	Baytown, TX
Exxon Beaumont	Beaumont, TX
Flint Hills (East & West)	Corpus Christi, TX
Motiva	Port Arthur, TX
Phillips 66	Borger, TX
Premcor	Port Arthur, TX
Valero (East & West)	Corpus Christi, TX
Western Refinery (formerly Chevron)	El Paso, TX

Collectively, the above facilities reported releasing 45,394,557 pounds of excess emissions during 2003. These emissions included 136,960 pounds of butadiene and 163,666 pounds of benzene. It is still not clear, however, that facilities are always reporting all excess emissions. Some reports suggest that emissions from maintenance activities may either be underestimated, or simply not reported at all. For example, Huntsman's chemical plant in Odessa reports no emissions at all for startup, shutdown, or maintenance activities, making it unique among petrochemical plants in Texas. The Phillips 66 refinery in Borger reports substantial VOC emissions from cleaning out product storage tanks, but other refineries either show much lower releases or do not report any tank maintenance for 2003.

NOTES

¹ 30 TEX. ADMIN. CODE §101.222(b) & (d).

² 30 TEX. ADMIN. CODE §101.222(c) & (e).

³ 30 TEX. ADMIN. CODE §101.222(f).

⁴ As noted previously, EPA has made clear to Texas that these emissions must be included in permits. Letter from David Neleigh, EPA Region 6 Chief Air Permits, to John Steib, Texas Commission on Environmental Quality Director Air Permits Division (May 1, 2002).

⁵ TEX. ADMIN. CODE §101.201.

⁶ The duration included in the Texas spreadsheets generally indicates the duration of the event and not necessarily the duration of the excess emissions caused by the event.

ATOFINA PETROCHEMICALS PORT ARTHUR COMPLEX • Port Arthur, Jefferson County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/30/04	Boiler	Boiler Stack		48.0				240.0					Malfunction
1/30/04	FCCU Blind	North Flare		27.0	776.0								Maintenance
1/28/04	FCCU	North Flare		144.0	1,527.2								Malfunction
1/28/04	H300 Package Boiler	Package Boiler Stack		120.0				600.0					Maintenance
12/31/03	SRU-1 Condensor Dip Leg Valve	North Flare		4.6	27,426.0	297.3							Malfunction
12/31/03	SCOT	Tail Gas Incinerator		11.3	10,711.0	117.0							Malfunction
12/31/03	Continuous Catalyst Regeneration Reformer Unit	North Flare		336.0	3,672.0	39.8							Shutdown
12/31/03	Continuous Catalyst Regeneration Reformer Unit	South Flare		336.0	544.7								Shutdown
12/27/03	Middle/South Header	Flare		24.0	6,750.0								Malfunction
12/23/03	ACU-2 Compressor	Flare		5.4	2,148.4	23.3							Malfunction
12/13/03	Refinery Powerloss	South Flare		9.8		218.3							Malfunction
12/12/03	Main Air Blower	North Flare		3.3					800.0				Malfunction
12/11/03	Refinery Powerloss	North Flare		62.5		910.1							Malfunction
12/9/03	Refinery Power Loss	Tailgas		192.9	25,898.3	280.8	806.4	158.3					Malfunction
12/9/03	Power Loss	South Flare		14.0	53,551.8	436.7	784.8	115.0					Malfunction
12/9/03	Resid Processing Complex	North flare		101.8	97,847.3		2,834.4	420.5					Malfunction
12/9/03	Refinery Powerloss	North Flare		8.4		112.9							Malfunction
11/19/03	Cogen Stack	Cogen Stack Breakout		19.7				2,448.0					Malfunction
11/19/03	Electrical supply	North Flare		0.6	865.5								Startup
11/18/03	SCOT Tailgas Incinerator	SCOT Tail Gas Incinerator		22.4	12,409.0	101.7							Malfunction
11/9/03	Flare Recovery System	South Flare		1.0	6,785.7			169.0	332.8	42.7			Malfunction
10/20/03	Cogeneration Unit	Cogen Unit		240.0				300.0					Startup
10/16/03	SCOT	Tailgas Incinerator		8.5	6,735.0	73.0							Malfunction

Atofina Petrochemicals Port Arthur Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/16/03	SCOT	North Flare		1.8	1,212.0								Malfunction
10/10/03	Cogen Unit	Cogen Unit		600.0				300.0					Shutdown
10/8/03	SRU-3 & SCOT	Flare		1.0	2,881.0	31.2	2.7	0.5					Malfunction
10/7/03	SCOT Feed Valve	Tail Gas Thermal Oxidizer		1.2	1,820.4		2.3	0.4					Malfunction
10/7/03	SCOT Feed Valve	North Flare		1.2	33,370.0	361.8	42.0	8.3	1.2				Malfunction
9/29/03	NOx Steam Injection System	Cogen Unit		193.0				1,779.4					Malfunction
9/26/03	SRU-1 SRU3	SRU & Tailgas		6.7	3,576.8	38.8							Malfunction
9/24/03	SRU	North Flare		125.8	19.1	0.2	2,745.3	538.8	701.1				Malfunction
9/21/03	SCOT Stripper Reboiler	North Flare		8.7	1,483.3	21.9	1.9	0.4					Malfunction
9/20/03	Flare Gas Recovery Compressor	South Flare		128.0	1,154.0	12.5	3.9	0.8	38.8	6			Maintenance
9/9/03	SRU1, SWS2	Sulfur Recovery Tail Gas TO		1.0	141.9	1.5	4.4	0.9					Startup
9/8/03	SCOT Inlet Feed Valve	Sulfur Recovery Tail Gas Thermal Oxidizer		25.7	21,741.3	261.0							Malfunction
9/8/03	SRU-3	North Flare		5.5	82,972.0	899.4							Malfunction
9/8/03	Sour Water Stripper	South Flare		1.6	2,939.0								Startup
9/8/03	SRU1, SWS2	South Flare		0.4	382.7	4.2	0.4	0.1					Startup
9/3/03	Unibon	North Flare		1.9	3,869.8	42.0							Startup
8/25/03	SRU 1 & 3	North Flare		72.0		17,000.0							Shutdown
8/25/03	SRU 1 & 3	South Flare		125.8	16,000.0	17,000.0	2,021.3	269.6					Shutdown
8/25/03	C-200	South Flare		398.6		161.5			3,738.3	62			Shutdown
8/16/03	13C-1B Compressor	North Flare		18.0	23,600.7	256.2	1,476.4	242.8	407.8				Malfunction
7/25/03	ISOM Unit	North Flare		92.0			5.7	0.8	10.5				Malfunction
7/17/03	SRU-1 SWS2 line	South Flare		5.8	3,936.0	44.8	10.8	2.1	5.2				Malfunction
7/5/03	DH1 & DH2	S. Flare		385.0	3,193.3	34.6	432.8	83.8	808.4	20			Maintenance
7/4/03	DHT1 & DHT2	North Flare		412.8	82,14	,89	15,030.8	2,709.1	5,253.1				Maintenance
7/4/03	East End Turnaround	North Flare		400.0				240.7					Malfunction
6/21/03	C200 Leaking Valve	South Flare		1.3	2,241.0								Malfunction

Atofina Petrochemicals Port Arthur Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/20/03	Sour Fuel Gas Compressor leaking valve	Sour Fuel Gas Compressor		5.8		100.0							Malfunction
6/14/03	SRU-1	SRU Reactor		120.0		100.0							Malfunction
6/14/03	SRU-1	North Flare		120.0	354,255.3	3,841.0		83.2					Malfunction
6/13/03	Sour Water Stripper 1	South Flare		3.0	5,371.0			1.1					Startup
6/12/03	SRU-3	Flare		131.0	250,822.4	7,138.0		55.7					Malfunction
6/12/03	SRU-3	SRU Reactor		0.2		24.3							Malfunction
6/5/03	Tank 926	Tank 926		5.7						49			Maintenance
6/4/03	Ground Fault 69 KV power line	FCCU Regenerator Flue Gas Wet Scrubber		29.0	1,362.0								Malfunction
6/3/03	Ground Fault 69 KV power line	North Flare		72.0		159.0							Malfunction
6/3/03	Ground Fault 69 KV power line	North Flare		219.5	66,261.0			1,678.0					Malfunction
6/3/03	Ground Fault 69 KV power line	South Flare		1.4		58.0							Malfunction
6/3/03	Ground Fault 69 KV power line	South Flare		178.5	28,847.0			1,281.0					Malfunction
5/27/03	FCCU	Regenerator Stack		12.0				208.0					Malfunction
5/17/03	Incinerator Waste Heat Boiler	Sulfur Recovery Tail Gas Thermal Oxidizer		28.8	2,709.9	29.4	84.4	16.6					Malfunction
5/17/03	Incinerator Waste Heat Boiler	South Flare		28.8	3,691.0	40.0	3.4	0.7					Malfunction
5/17/03	Incinerator Waste Heat Boiler	North Flare	35.0 % op	28.8	764,859.1	8,292.5	963.6	189.2	26.4				Malfunction
5/1/03	Depentanizer Overhead Drum	Reformer Unit		31.0					5,599.4	220.0			Malfunction
4/17/03	C200 Compressor	South Flare		4.1		114.8	328.4	45.5	179.0				Malfunction
4/7/03	C200 Compressor	South Flare		2.0	8,820.5	95.6	174.8	24.2	110.5				Malfunction
4/7/03	PAR Substation Lightning Strike	Sulfur Recovery Tail Gas Thermal Oxidizer		55.8	48.6	0.5	3.4	0.5					Malfunction
4/7/03	PAR Substation Lightning Strike	South Flare		55.8	1,323.0	14.3	1.4	231.2	0.5				Malfunction
4/7/03	PAR Substation Lightning Strike	North Flare		55.8	2,591,492.0	28,124.0	3,956.0	736.5	3,286.0				Malfunction
4/4/03	V-6 Water Boot	North Flare		45.2			383.3	57.1	1,851.0				Malfunction

Atofina Petrochemicals Port Arthur Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
3/11/03	SRU-1 Furnace	Sulfur Recovery Tail Gas Thermal Oxidizer		39.3	390.2	4.2	12.2	2.4					Malfunction
3/11/03	SRU-1 Furnace	South Flare		39.3	186.4	2.0	0.2	0.0					Malfunction
3/11/03	SRU-1 furnace	SRU Fugitives		39.3	1,379.5	1,900.2							Malfunction
3/11/03	SRU-1 furnace	North Flare		39.3	280.9	3.1	8.8	1.7					Malfunction
3/2/03	T4 Line	Sulfolane Unit Fugitives		1.0						13.5			Malfunction
2/28/03	Refinery Crude Units	Flare		63.0	5,626.0			50.0					Malfunction
2/27/03	Sulfolane Unit T4 Recovery Tower Inlet Line	Sulfolane Unit & Fugitives		5.0						29.1			Malfunction
2/8/03	SSMP	DHT 1, 2 & C-2000	35	336.0	10,000.0	150.0	30.0	11.0	30.0				Startup
2/8/03	DHT 1 & 2	DHT 1 & 2	35	336.0	900.0	10.0	140.0	22.0	100.0				Shutdown
2/8/03	DH1 & DH2	Distillate Hydroheater No. 1, No.2 & C-200	35	336.0	450,000.0	7,000.0	11,000.0	1,480.0	900.0				Maintenance
2/5/03	Alkylation Unit A1 Contactor	A. Contactor		10.5			27.0	3.8	420.2				Maintenance
TOTALS				7,234.9	5,012,808.1	95,983.3	43,322.9	16,808.2	24,600.0	442.7	0.0		

BASF FINA NAFTA REGION OLEFINS COMPLEX • Port Arthur, Jefferson County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/29/04	Deethanizer Tower	Ground Flare		0.5					425.0				Malfunction
1/29/04	Deethanized Tower	Flare		3.0			717.0	100.0	381.0				Malfunction
1/23/04	C4 Complex	Flare		24.0			171.0	23.0					Startup
1/23/04	Deprop T-6301	Flare		240.0			94,000.0	13,650.0	120,400.0				Startup
1/22/04	Cogen	Flare		23.0				316.0					Startup
1/5/04	Furnace	Decoking Drum	50	0.7									Opacity
12/22/03	Ethylene Compressor	Ground Flare		8.6					2,968.0		1.0		Malfunction
12/22/03	Ethylene Compressor	Ground Flare		0.5					172.0				Malfunction
12/22/03	Ethylene Compressor	Flare		1.5					3,712.0				Malfunction
12/21/03	Ethylene Compressor	Ground Flare		2.4					2,530.0				Malfunction
12/21/03	Ethylene Compressor	Ground Flare		11.2			14,323.0	1,983.0					Malfunction
12/21/03	Hydrotreater	HP Flare		73.0	1,776.0		246.0	34.0					Startup
12/8/03	Debutanizer	HP Flare		1.0			600.0	83.0					Startup
12/8/03	Debutanizer Tower	HP Flare		1.0					817.1		3.0		Startup
12/8/03	Polyreactor	HP Flare		0.0			1.0	2.0					Startup
12/5/03	C4 Complex	Reactor Feed Heater		336.0									Startup
12/1/03	Ethylene Absorber	Flare		3.0			9.0	1.1					Startup
10/20/03	Acetylene Converter	Flare		11.4			236.0	33.0	245.0				Maintenance
9/19/03	Cooling Tower	Leak		1,311.0					936.0	276.0	476.0		Malfunction
9/18/03	Propylene Fractionator	Flare		1.8					719.0				Malfunction
9/17/03	Quench Tower	Leak		989.0					57.0	57.0			Malfunction
9/17/03	Quench Tower	Quench Tower Exchanger		125.0						73.0			Malfunction
9/13/03	Change Gas Comp.	Ground Flare		121.6					25,934.0				Startup
9/12/03	Change Gas Comp.	Ground Flare		2.3					28.0				Startup

BASF Fina Nafta Region Olefins Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _X	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/12/03	Change Gas Comp.	Ground Flare		146.6			220,318.0	30,503.0					Startup
9/12/03	Change Gas Comp.	Ground Flare		86.8					150,497.0	19,304.0	10,069.0		Startup
9/12/03	Change Gas Comp.	Ground Flare		6.0					5,750.0				Startup
9/12/03	Change Gas Comp.	Ground Flare		9.3					8,556.0				Startup
9/12/03	Change Gas Comp.	Ground Flare		18.3					61.0				Startup
9/12/03	Change Gas Comp.	Ground Flare		3.1					1,156.0				Startup
9/12/03	Change Gas Comp.	Ground Flare		0.7					281.0				Startup
9/12/03	Change Gas Comp.	Ground Flare		2.0					80,165.0	254.0	6,431.0		Startup
9/12/03	Change Gas Comp.	Ground Flare		11.5					11,007.0				Startup
9/12/03	Change Gas Comp.	Ground Flare		6.8					8,227.0		4.0		Startup
9/6/03	Cogen	Leak		9.0				75.8					Maintenance
8/29/03	Transformer	Cogen		219.0				79.6					Maintenance
8/29/03	Transformer	Cogen		44.0				242.8					Maintenance
8/26/03	Charge Gas Compressor	Ground Flare		0.0									Maintenance
8/26/03	Charge Gas Compressor	Ground Flare		70.3					97.0				Maintenance
8/26/03	Charge Gas Compressor	Ground Flare		2.0					2,352.0	38.0	259.0		Maintenance
8/26/03	Charge Gas Compressor	Ground Flare		389.0			44,519.0	6,165.0					Maintenance
8/26/03	Charge Gas Compressor	Ground Flare		3.3					59.0				Maintenance
8/26/03	Charge Gas Compressor	Ground Flare		49.8					55,507.0	7,122.0	3,715.0		Maintenance
8/26/03	Change Gas Comp.	Ground Flare		2.0					2,229.0				Maintenance
8/26/03	Change Gas Comp.	Ground Flare		49.0					9,394.0				Maintenance
8/24/03	Charge Gas Compressor	Ground Flare		24.3			61,850.0	8,563.0	99,921.0	12,817.0	6,685.0		Malfunction

BASF Fina Nafta Region Olefins Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _x	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
8/24/03	Charge Gas Compressor	Ground Flare		0.3					121.0				Malfunction
8/24/03	Charge Gas Compressor	Ground Flare		5.3					2,174.0				Malfunction
8/24/03	Charge Gas Compressor	Ground Flare		6.2					9.0				Malfunction
7/4/03	Prop. Refrig. Compressor	Flare		31.3					138,467.0	2,241.0	15,175.0		Malfunction
7/4/03	Prop. Refrig. Compressor	Ground Flare		12.0					22.0				Malfunction
7/4/03	Prop. Refrig. Compressor	Ground Flare		6.3					3,868.0				Malfunction
7/4/03	Prop. Refrig. Compressor	Ground Flare		5.3					3,818.0				Malfunction
7/4/03	Prop. Refrig. Compressor	Ground Flare		26.8					189.0				Malfunction
7/4/03	Prop. Refrig. Compressor	Ground Flare		21.3					3,374.0		1.0		Malfunction
7/4/03	Prop. Refrig. Compressor	Ground Flare		3.3					1,625.0				Malfunction
7/4/03	Prop. Refrig. Compressor	Ground Flare		1.5					1,500.0				Malfunction
7/4/03	Prop. Refrig. Compressor	Ground Flare		51.0			133,799.0	18,525.0					Malfunction
5/28/03	MAPD Reactor	Ground Flare		0.0				14.0	132.0				Malfunction
5/18/03	Quench Water Reboiler	Ground Flare		1.2				396.0	1,963.0				Malfunction
5/14/03	Acetylene Converter	Ground Flare		2.9					205.0				Malfunction
5/4/03	Charge Gas Compressor	Flare		0.2				100.0	912.0	15.0	101.0		Malfunction
5/4/03	Charge Gas Compressor	Flare		1.5				185.0	1,317.0				Malfunction
4/26/03	Quench Tower	Fugitive		79.9					291,142.0	18,981.0	13,782.0		Malfunction
4/25/03	Deethanizer	Ground Flare		1.2				8.0	76.0				Malfunction
4/25/03	Cogeneration Unit 1	Ground Flare		11.1				2,600.0	17,523.0	1,281.0	668.0		Malfunction
4/17/03	Deethanizer	Ground Flare		1.7				23.0	214.0				Malfunction
4/6/03	Propylene Refrigeration Compressor Sys.	Ground Flare		6.0				1,139.0	10,674.0				Malfunction

BASF Fina Nafta Region Olefins Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _X	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
3/28/03	Plant Wide	Flare		1.4				216.0	2,568.0	324.0	169.0		Malfunction
3/28/03	DCS Cabinet Power Supply	Ground Flare		123.2				32,061.0	319,349.0	27,933.0	22,651.0		Startup
3/25/03	Charge Gas Compressor	Ground Flare		0.2				56.0	694.0	92.0	48.0		Malfunction
3/20/03	Prop. Compressor	Ground Flare		55.5				16,937.0	127,336.0	466.0	3,153.0		Malfunction
2/8/03	Depropanizer	Depropanizer Reflux Drum		0.2					128.0				Malfunction
TOTALS				4,900.2	1,776.0	0.0	570,789.0	134,114.3	1,523,983.1	91,274.0	83,391.0		

BLALOCK BOOSTER STATION • Garden City, Glasscock County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _X	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/2/04	engine	blowdown vent		10.3					29,518.6				Malfunction
1/2/04	engine	blowdown vent		10.3					29,518.6				Malfunction
1/2/04	engine	blowdown vent		10.3					29,518.6				Malfunction
1/2/04	engine	blowdown vent		10.3					29,518.6				Malfunction
10/14/03	booster	blowdown vent		8.0					10,834.0				Malfunction
10/6/03	pipe	engine blowdown		1,104.0					106,623.5				Malfunction
10/5/03	engine	upset vent		3.5					11,305.0				Malfunction
8/29/03	engine	blowdown vent		11.0					58,435.3				Malfunction
8/17/03	stabilizer	blowdown vent		6.5					22,256.8				Malfunction
8/2/03	booster engine	blowdown vent		5.3					66,113.1				Malfunction
8/1/03	engine	blowdown vent		4.5					22,673.1				Malfunction
7/30/03	engine	blowdown vent		3.7					14,737.5				Malfunction
6/12/03	field launch ball	blowdown vent		7.5					54,132.1				Malfunction
6/18/03	field launch ball	blowdown vent		1.7					7,510.3				Malfunction
5/26/03	plant down	blowdown vent		2.5					37,410.7				Malfunction
5/26/03	engine	blowdown vent		4.5					23,863.5				Malfunction
5/24/03	turbine	blowdown vent		4.5					101,263.8				Malfunction
4/29/03	regen heater	blowdown vent		888.5					168,716.4				Malfunction
4/16/03	pipeline replacement	blowdown vent		13.1					191,507.8				Malfunction
2/24/03	engine	blowdown vent		2.2					13,290.3				Malfunction
2/23/03	booster	blowdown vent		16.6					201,727.7				Malfunction
TOTALS				2,128.8	0.0	0.0	0.0	0.0	1,230,475.4	0.0	0.0		

BOYD COMPRESSOR STATION SAN ANGELO • Reagan County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/14/03	Engine/Compressor	Vent 1		13.5					1,666,664.58	218.02			Malfunction
9/7/03	STK bypass valve	Vent 1		5.0					27,844.85	36.42			Malfunction
8/24/03	STK-13	Vent 1		4.0					55,709.35	72.87			Malfunction due to poor maintenance
8/23/03	Compressor	Vent 1		17.0					24,119.30	31.55			Malfunction
8/19/03	STK-C14	Vent 1		4.0					27,247.41	35.64			Malfunction
8/7/03	STK-C13&14	Vent 1		2.0					32,663.25	42.73			Malfunction
7/6/03	STK-C13	Vent 1		2.0					8,877.51	11.61			Malfunction
7/3/03	STK-C13	Vent 1		2.0					18,161.98	23.76			Malfunction
7/2/03	Inlet Piping	Vent 1		1.0					16,810.18	21.99			Malfunction
7/1/03	STK-C15	Vent 1		4.0					69,102.01	90.38			Maintenance
6/28/03	STK-C13&14	Vent 1		9.0					44,760.39	58.53			Malfunction
6/25/03	STK-C13&14	Vent 1		5.0					24,052.97	31.46			Shutdown causing a malfunction
6/25/03	ESD system	Vent 1		24.0					316,118.60	413.52			Malfunction
6/24/03	Pressure Control Valve	Vent 1		5.7					28,718.76	37.57			Malfunction
6/22/03	STK-C13	Vent 1		2.3					24,787.37	32.42			Malfunction
6/21/03	C-13 compressor	Vent 1		1.0					16,735.25	21.89			Malfunction
6/20/03	STK-14	Vent 1		2.0					35,830.47	46.84			Malfunction
6/13/03	Inlet Pressure Control Valve	Vent 1		13.5					42,869.86	56.08			Malfunction
6/12/03	STK-C14	Vent 1		7.0					30,682.71	40.14			Shutdown for Maintenance
6/12/03	STK-C14	Vent 1		8.0					78,444.55	102.61			Maintenance
6/11/03	STK-C13&14	Vent 1		5.0					30,764.80	40.24			Malfunction
6/9/03	STK-C13	Vent 1		4.0					13,904.00	18.19			Malfunction
6/9/03	STK-C13&14	Vent 1		4.3					43,851.65	57.36			Malfunction
6/7/03	ESD systm	Vent 1		9.3					135,976.39	177.87			Malfunction
6/6/03	STK-C13&14	Vent 1		3.0					39,960.20	52.27			Malfunction
6/3/03	STK-C14	Vent 1		1.0					9,239.06	12.09			Malfunction
6/3/03	STK-C14	Vent 1		1.5					12,599.34	16.48			Malfunction
6/2/03	STK-C14	Vent 1		1.8					24,521.03	32.08			Malfunction

Boyd Compressor Station San Angelo , continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/1/03	Boyd #14	Vent 1		2.3					31,727.12	41.50			Malfunction
5/30/03	9mile unit	Vent 1		2.0					12,424.68	16.25			Malfunction
5/28/03	STK-C15	Vent 1		24.0					295,177.92	386.13			Shutdown for repairs accompanied by a malfunction
5/25/03	STK-14&15	Vent 1		3.0					11,012.16	14.41			Malfunction
5/24/03	STK-13, 14&15	Vent 1		4.0					47,075.47	61.58			Malfunction
4/30/03	STK-13, 14&15	Vent 1		4.0					12,172.21	15.92			Malfunction
4/30/03	STK-15	Vent 1		7.0					21,301.39	27.86			Shutdown for Maintenance
4/27/03	STK-C13&15	Vent 1		4.5					29,337.91	38.38			Malfunction
4/27/03	Inlet PSI	Vent 1		1.5					19,948.65	26.10			Malfunction
4/16/03	Stk-C13	Vent 1		8.0					7,766.74	10.16			Malfunction
4/12/03	Boyd units	Vent 1		4.0					43,662.52	98.99			Malfunction
3/13/03	Inlet ESD	Vent 1		22.0					46,329.70	60.60			Malfunction
2/25/03	STK-C15	Vent 1		4.0					7,550.04	17.12			Malfunction
2/24/03	Compressor Engine	Vent 1		4.0					63,517.21	144.01			Malfunction
TOTALS				255.9	0.0	0.0	0.0	0.0	3,550,021.54	2,791.62	0.0		

BP PRODUCTS NORTH AMERICA • Texas City, Galveston County TX
Emissions Data: 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/26/04	FCCU 2	Electrostatic Precipitator Stack	46	0.1								alumina silica catalyst fines: 3	Malfunction
1/16/04	Portable air compressors	Short-loop atmospheric vent		24.0					17.1	17			Malfunction
1/13/04	#8 Transformer	Electrostatic Precipitator	32	0.2								alumina silica catalyst fines: 34	Malfunction
1/10/04	E-15C Firebox	E-15C Firebox		288.0	106.0								Malfunction
1/8/04	K1A air blower	SRU Incinerator Stack	25	0.2	385.0								Malfunction
1/8/04	FCCU2	Waste Heat Bioler	80	12.0									Malfunction
1/7/04	400# Air Liquide	Hyd. Flare		1.6			390.9	32.8					Malfunction
1/5/04	Overhead Condenser	Hot Well		0.8		254.0	60.0		868.8	5.0			Malfunction
1/5/04	alkylation unit 3	flare 6		120.0			6,474.0	5,631.0					Shutdown
1/4/04	HRU Unit	Flare #3		4.3	0.2		391.6	49.8					Malfunction
1/3/04	P4444 vent	P4444 vent		24.0					2.0	2.0			Shutdown
1/3/04	FCCU3	FCCU3	55%	11.5								alumina silica catalyst fines: 320	Shutdown
1/1/04	Selective Hydrogenation Unit	Flare 3		70.9	0.2		461.0	62.0					Shutdown
12/24/03	157F-EP drum	Ultracracker Fugitive		3.0					991.0				
12/23/03	157F-EP Drum	Flare #3		5.6					2,737.0				Malfunction
12/23/03	157F-EP Drum	Flare #1		5.6					387.0				Malfunction
12/23/03	157F-EP drum	Flare #1		3.2				25.6					Malfunction
12/23/03	157F-EP drum	Ultracracker Fugitive		3.2					140.0				
12/23/03	157F-EP drum	Flare #3		3.0				205.0	145.0				Malfunction
12/20/03	Dock 54A	Dock 54 Fugitives		3.0					2,006.0	1,551			Malfunction
12/15/03	Bypass Valve on P-444A	UU4-P444A Vent		24.0					13.0	13			Malfunction
12/13/03	401E Overhead Tower	Relief Valve		0.0					13.0	13			Malfunction
12/9/03	FCCU1	ESP	23.5	1.1								Alumina Silica Catalyst Fine: 45.4	Maintenance
12/8/03	A& B educators	A& B educators		14.7		57.0							Maintenance

BP Products North America, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/4/03	CRPII Flare	CRPII Flare		0.9			70.2	9.3					Malfunction
12/2/03	100-J Compressor	ULC Flare		1.3	225.9								Malfunction
12/2/03	Loss of ammonia	ESP Stack	32	0.6								alumina silica catalyst fines: 34	Malfunction
11/16/03	Hydrogen #1	Hydrogen Flare		12.2			3,621.0	270.0					Startup
11/14/03	Incinerator Stack	Incinerator Stack		24.0		161.0							
11/14/03	Incinerator Stack	ABCDE Educators		24.0		412.0							
11/9/03	J-475	Flare 2		0.3	829.0		39.0	3.4					Malfunction
11/7/03	Hydrogen 1	Hydrogen Flare		0.7				132.2					Startup
11/4/03	139-C	Ultracracker		15.0					22,185.0				Malfunction
10/30/03	FCCU1	ESP	35	0.2								alumina silica catalyst fines: 7	Malfunction
10/30/03	The FV-2077 Valve	Flare 4		1.3			20.0	2.2					Malfunction
10/30/03	J-4 Lift Air Blower	Electrostatic Precipitator	35	0.2								Silica: 7	Malfunction
10/29/03	D Incinerator	A& B educators		384.0		2,836.0							Maintenance
10/28/03	Hydrogen 1	Hydrogen Flare		5.8			2,914.7	102.4					Startup
10/27/03	Power Station 4 Substation	Desalter Relief Valve 17 & 18		3.0		93.0			6,837.0	7.0			Malfunction
10/27/03	138kV	Flare 2		7.0	8975.49		358.4	33.5					Malfunction
10/27/03	138kV	Flare 1		10.2			284.3	37.8					Malfunction
10/27/03	FCCU 3	408 F Low pres/ high temp. sep. relief valve		0.2		2.0			52.0			0.08 - Ammonia	Malfunction
10/27/03	FCCU 3	CRPII Flare		12.0	1,066.0		134.0	12.0	1,000.0				Malfunction
10/27/03	FCCU 3	Electrostatic Precipitator	45	1.0								20.0 - Alumina Silica Catalyst Fines	Malfunction
10/27/03	FCCU 3	Electrostatic Precipitator	90	1.0								20.0 - Alumina Silica Catalyst Fines	Malfunction
10/27/03	FCCU 3	Electrostatic Precipitator	76	1.0								28.0 - Alumina Silica Catalyst Fines	Malfunction
10/27/03	FCCU 3	DDU Flare		0.9			124.0	17.1					Malfunction
10/27/03	FCCU 3	Flare 4		10.5			740.3	69.5	449.8				Malfunction
10/27/03	FCCU 3	Flare 3		10.4			1314.9	175.0					Malfunction

BP Products North America, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/27/03	Light Ultraformate Line #726	Line #726		4.0					2.4	2.4			Malfunction
10/26/03	J-475 Wet Gas Compressor	Flare 2		0.2	451.0		18.0	2.2					Malfunction
10/15/03	Regenerator	Electrostatic Precipitator Stack	54	0.5									Malfunction
10/14/03	101-J Recycle Gas Compressor	ULC 101-J recycle compressor		0.7	603.1	6.5	163.0	14.2	47.6				Malfunction
10/14/03	101-J Recycle Gas Compressor	DDU Flare		2.0	500			110	2000				Malfunction
10/8/03	FCCU2	Flare 2		1.8	221.0		24.0	3.4	103.1				Startup
10/8/03	FCCU2	ESP	31	0.1								alumina silica catalyst fine:3	Startup
10/7/03	FCCU2	Electrostatic Precipitator Stack	53	360.0								4.0 - Silica	Malfunction
10/7/03	Hydrogen 1	Hydrogen Flare		1.0			7,947.0	431.0	5.0				Startup
10/5/03	606 E-Recovery Tower	610 F-Underground Sump		12.0					10.0	10.0			Shutdown
10/5/03	606 E-Recovery Tower	ARU flare		24.0					17.0	17.0			Shutdown
9/24/03	CFHU	CRPII Flare		11.0	101.0	1.0	134.0	17.0	18.0				Startup
9/19/03	Portable Propane Burner	Portable Propane Burner		7.6			59.0	20.0	105.0				Maintenance
9/12/03	RDU	Flare 3		72.0	25.0		6.0	1.0	17.0				Startup
9/8/03	C-418 Recycle Gas Exchanger	UU4 Cooling Tower		696.0					71,397.0	4,624.0	310.0		Malfunction
9/6/03	Vacuum Tower	CRPII flare		48.0			31.0	4.5	2.0				Shutdown
9/3/03	CFHU	Flare 1		24.0			96.0	9.0	89.0				Shutdown
9/1/03	PS3B hotwell	Sewer		0.1		471.0							Malfunction
8/28/03	Coker A C101CB overhead cooler exchanger	Cooling Tower		223.0					7,608.0				Malfunction
8/25/03	FCU 1	Electrostatic Precipitator Stack		12.0			15,000.0						Maintenance
8/25/03	Universal Control Module	Electrostatic Precipitator Stack	99%	1.0								catalyst fines	Shutdown
8/23/03	K1301/2	PX2 Refrigeration Compressor		504.5				31.0	733.0				Malfunction
8/22/03	Hydrogen 2	Hydrogen Flare		29.2			9,674.0	668.0					Startup

BP Products North America, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
8/21/03	609E Benzene Tower	ARU Flare		24.0					20.0	20.0			Startup
8/18/03	FCCU2	EA-301 B & D exchanger bundles	80%	96.0	4,000.0			135.0	1,200.0				Maintenance
8/18/03	FCCU2	flare 2		3.0	4,000.0			135.0	1,200.0				Shutdown
8/16/03	100-J Compressor	ULC Flare		6.8	589.0		253.0	24.0	152.0				Startup
8/12/03	Ultracracker	ULC Flare		96.0	1,379.0		1,714.0	161.0	581.0				Startup
8/11/03	3/4" nipple on fuel gas line	Fuel Gas Line		9.3		2.0			1,969.0				Malfunction
8/11/03	RHU 500	CRPII flare		24.0				115.0					Startup
8/8/03	EA301-B or EA301-D	FCCU2 Cooling Tower		247.0					14,260.0				Malfunction
8/6/03	ARU A	609E Benzene tower		24.0					21.0	21.0			Shutdown
8/4/03	609 E Benzene tower	609 E Benzene Tower		24.0					107.0	107.0			Malfunction
8/4/03	ARU 609EA Benzene tower	ARU 609EA Benzene tower		24.0					20.0	20.0			Startup
7/30/03	FCCU 2	FCCU 2	80%	4.0			15,000.0						Shutdown
7/24/03	609 EA Benzene tower	609 EA Benzene Tower		21.0					55.0	55.0			Malfunction
7/22/03	Reactor	Electrostatic Precipitator Stack	42	0.2								alumina silica catalyst fine: 6	Malfunction
7/18/03	116F drum	Blowdown Stack		0.2		100.0			10.0	10.0			Malfunction
7/15/03	FCCU2	Electrostatic Precipitator Stack	42	0.5								alumina silica catalyst fine: 14	Malfunction
7/14/03	Sulfur Trains	SRU	25%	0.5	769.0								Malfunction
7/6/03	Regenerator Standpipe	ESP	75	0.1								Alumina Silica catalyst fine: 5	Malfunction
6/29/03	J-426 Gas Compressor	Flare 1		2.2	1,655.0		53.0	6.0	67.6				Malfunction
6/29/03	Cooling Chiller System	Chiller System Relief Valve		0.3								R-134A Refrigerant	Malfunction
6/25/03	FCCU 3	ESP	34	6.0								Alumina Silica Catalyst Fine: 108	Startup
6/24/03	FCCU3	Flare 3		25.9	1,826.0		351.0	33.0	866.0				Startup
6/24/03	FCU3	Electrostatic Precipitator Stack	42%	16.8			4,234.0						Maintenance
6/24/03	FCU 3	Flare 3		16.8			13,169.0	1,337.0	2,630.0				Maintenance

BP Products North America, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/24/03	FCCU 3	Electrostatic Precipitator Stack	31%	1.3									Shutdown
6/23/03	FCCU3	Flare 3		1.3	2,961.0			48.0	602.0				Shutdown
6/19/03	Equipment clearing	Flare 3		4.7				37.0	700.0				Maintenance
6/13/03	2/3 Gas Compressor	Electrostatic Precipitator Stack	47	0.2								alumina silica catalyst fine: 22	Malfunction
6/13/03	FCCU1	Flare 4		3.0			52.0	18.0	1,522.0				Startup
6/6/03	FCCU3	OMCC	51	0.2								alumina silica catalyst fine: 33	Malfunction
6/6/03	321-F depropanizer reflux drum	Flare 1		0.6	522.9		13.9	1.2	17.7				Malfunction
6/4/03	100-J Wet Gas Compressor	ULC 100-J Make Gas Compressor		21.2	223.0		1,310.0	242.0	1,702.0				Malfunction
6/4/03	100-J Wet Gas Compressor	ULC 100-J Make Gas Compressor		9.4	1,750.0		1,492.0	144.0	7,622.0				Malfunction
6/4/03	Ultracracker	ULC Flare		9.4	1,162.0	13.0	295.0	29.0	111.0				Startup
5/23/03	100 Series Butane Splitter	E102A and E102C		2,976.0					41,681.0				Maintenance
5/22/03	Coker/RDU	475-J Wet Gas Compressor		6.3	7,100.0								Startup
5/20/03	RGP line	ARU Flare		0.9			67.0	5.6	98.5				Malfunction
5/20/03	Coker Complex	Flare 2		3.0	187.0			1.1	6.0				Shutdown
5/19/03	Rich Amine	Inicinerator		8.0	2,965.0								Malfunction
5/18/03	Refinery Fuel Gas System	Refinery Furnaces		16.3	627.0								Malfunction
5/16/03	Refinery	Power Station 2		0.1		582.0			140.0				Malfunction
5/16/03	Refinery	ULC Flare		3.8	1,115.0		130.0	18.0	102.0				Malfunction
5/15/03	Airblower	Furnace		0.2	120.0								Malfunction
5/6/03	FCCU 1	Electrostatic Precipitator Stack	51	0.2								silica: 13	Malfunction
5/5/03	Sulfuric Acid Plant	Scrubber Stack		0.4	631.0								Malfunction
4/23/03	Blanking Plates	Tail Gas Scrubber	40	5.0								Sodium Hydroxide: 108	Malfunction
4/17/03	Refinery Fuel Gas System	Flare 3		3.0			191.0	18.0	215.0				Malfunction
4/16/03	FCCU1	ESP	80	5.0			50,000.0					alumina silica catalyst fine: 100	Startup
4/16/03	FCCU1	Flare 4		5.0	2,500.0			250.0	2,500.0				Startup

BP Products North America, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
4/16/03	FCCU1	Flare 4		2.9	422.0			3.3	15.0				Startup
4/15/03	Coker/RDU Wet Gas Turbine	Flare 2		0.6	1,194.0		31.0	4.0	44.0				Malfunction
4/15/03	Coker/RDU Wet Gas Turbine	Power 4		0.6	1,000.0			100.0	500.0				Malfunction
4/15/03	FCCU1	Flare 4		16.9	5,187.0			32.0					Malfunction
4/15/03	FCCU1	Power 4		16.9	1,000.0			16.5	500.0				Malfunction
4/14/03	FCCU2	Flare 2		168.0	100.0		23.0	2.2	55.0				Startup
4/11/03	Sulfuric Acid Plant	Tail Gas Scrubber Stack	60	48.0									Startup
4/11/03	Sulfuric Acid Plant	Tail Gas Scrubber	60	48.0									Startup
4/10/03	West inlet hopper	FCCU2	31%	3.0									Maintenance
4/9/03	504E vapor recovery tower	Flare 4		2.5	954.0								Malfunction
4/9/03	Sulfuric Acid Plant	Tail Gas Scrubber Stack	60	0.0									Shutdown
4/7/03	sulfur trains	Incinerator Stack		4.4	1,743.0								Malfunction
4/4/03	Heavy Straight Run Gasoline Exchanger	Blowdown stack		0.6					0.3	0.3			Maintenance
4/2/03	Hydrogen Unit #2	Hydrogen Flare		8.2			10,964.0	263.0					Startup
4/1/03	FCU 3 reactor/regenerator	ESP	63	0.3								alumina silica catalyst fine:45	Malfunction
4/1/03	Hydrogen Unit #2	Hydrogen Flare		1.2			375.0	19.0					Shutdown
3/31/03	Depropanizer Charge Pumps	Blowdown Stack		14.0		56.0			2,589.0	28.0			Malfunction
3/30/03	Alkylation Unit 2	Flare 3		5.5				65.0	1,000.0				Maintenance
3/26/03	FCCU2	Electrostatic Precipitator	55	0.2								silica: 7	Shutdown
3/26/03	FCCU2	ESP	51	440.0			5,131.0					Silica: 14	Startup
3/25/03	Sulfuric Acid Plant	tail gas scrubber stack	10%	1.0									Shutdown
3/24/03	Ultracracker	ULC Flare		14.6	538.0	6.0	199.0	228.0	4,327.0	11.0			Startup
3/24/03	Sulfuric Acid Plant	Tail Gas Scrubber Stack	60	9.5									Startup
3/24/03	Ultracracker	Flare 1		0.0				350.0	1,360.0				Startup
3/22/03	FCCU2	ESP	80	96.0			300,000.0					Silica: 300	Startup
3/22/03	FCCU2	Flare 2		23.0	970.0		9,162.0	3,175.0	29,391.0				Startup

BP Products North America, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
3/21/03	Hydrogen 2	Hydrogen Flare		11.9			5,817.0	340.0					Startup
3/18/03	Feed Valves	Electrostatic Precipitator	32	0.6								Particulate Matter: 19	Malfunction
3/18/03	E-504 Sour Water Vapor Recovery Tower	Tank-161		7.0		6.0			5,035.4	0.4			Malfunction
3/18/03	Sour Water Tank #159	tank #159		27.0		500.0							Malfunction
3/17/03	Hydrogen Unit #2	Hydrogen Flare		0.3			165.0	11.1					Shutdown
3/16/03	100J Compressor	Flare 3		2.0	500.0			32.0	223.2				Malfunction
3/16/03	100J Compressor	Flare 1		19.0	500.0		181.0	24.0	172.2				Malfunction
3/16/03	ARU B Extraction	ARU Flare		24.4					44.0	27.0			Startup
3/15/03	FCCU 2	Tank 223		0.5		0.6			523.7	0.2			Maintenance
3/13/03	Alkylation Unit 2	Alkylation Unit 2		97.7	35.0		1,497.0	141.0	4,837.0				Startup
3/12/03	Splitter Overhead Tower	ULC Flare		0.0				110.0	710.0	10.0			Malfunction
3/12/03	FCCU2	Flare 2		48.0	26.0		461.0	61.0	376.0				Shutdown
3/12/03	FCCU 2	Electrostatic Precipitator Stack	58%	2.0									Shutdown
3/11/03	FCCU 1	Splitter Tower Relief Valve		0.0					1,073.0	20.0			Startup
3/10/03	Combustion Air Blower	Electrostatic Precipitator	81	0.1								Silica: 7	Malfunction
3/10/03	FCCU1	Flare 4		Unknown				814.0					Startup
3/10/03	FCCU2	ESP	31	3.0								Alumina Silica Catalyst Fine: 7	Startup
3/8/03	Ultracracker	ULC Flare		3.1	682.0	7.0	544.0	51.0	18,079.0				Startup
3/8/03	Hydrogen 1	HU Flare		0.0			4,855.0	313.0					Startup
3/7/03	FCCU1	ESP	80	5.0			14,841.0					Alumina Silica Catalyst Fine: 25	Startup
3/5/03	Sulfuric Acid Plant	Sulfuric Acid Plant	80	6.0									Startup
2/28/03	FCCU2	ESP	30	0.0								Alumina Silica Catalyst Fine: 300	Startup
2/28/03	FCCU2	Flare 2		48.0	403.0		49.0	4.5	73.0				Startup
2/26/03	FCCU2	ESP	77	75.0								Alumina Silica Catalyst Fine: 172	Startup
2/26/03	FCCU2	Flare 2		3.0	2,500.0			220.0	150.0				Startup
2/24/03	FCCU2	FCCU2	45	48.0								alumina silcate: 140	Shutdown

BP Products North America, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/24/03	HRU	HRU		0.0			39.0	3.4	48.9				Shutdown
2/24/03	HRU	HRU		0.0			44.0	6.0	46.1				Shutdown
2/12/03	Blowdown Stack MOV	Coker C		0.3		188.0	4.0		689.0				Malfunction
2/12/03	Refinery Fuel Gas	Distillate Desulfurization Unit		3.8	474.0	5.0		14.0	96.2				Normal Operation
2/11/03	Refinery Fuel Gas System	Power Station No. 2		8.1	1,914.0								Regular Operations
2/10/03	ESP	FCCU ₃	30%	0.5									Maintenance
2/9/03	ARU-B	Aromatics Recovery Unit		0.5					51.5	8.0			Shutdown
2/8/03	CRPI/ CRPII Flares	Sulfur Recovery Unit		0.9	46,520.0		62.0	8.0					Malfunction
2/8/03	CRPI/ CRPII Flares	Sulfur Recovery Unit		10.6	3,794.0								Malfunction
2/8/03	CRPI/CRPII Flares	Sulfur Recovery Unit		11.8	90,779.0		121.0	16.0				ammonia: 101	Malfunction
2/8/03	401J Air Blower	Fluid Catalytic Cracking Unit 3	63	2.1								Silica: 200	Malfunction
2/8/03	FCCU ₃	Flare 3		1.9	1,739.0		2,242.0	210.0	7,120.0				Startup
2/8/03	FCCU ₃	Flare 2		1.5	464.0		11.0	1.1	19.2				Startup
2/8/03	FCCU ₃	Flare 1		1.5			972.0	91.0	3,185.0				Startup
2/8/03	401J Air Blower & Wet Gas Compressor	Fluid Catalytic Cracking Unit 3		1.1	2,216.0		1,213.0	114.0	4,815.0				Malfunction
2/8/03	401J Air Blower & Wet Gas Compressor	Fluid Catalytic Cracking Unit 3		0.8	446.0		229.0	58.0	828.2				Malfunction
2/8/03	401J Air Blower & Wet Gas Compressor	Flare 2		5.8	1,871.0		119.0	11.2	667.0				Malfunction
2/8/03	503E Stripper Tower	FCCU ₃		3.2	734.0		229.0	78.0	439.0				Startup
2/8/03	FCCU ₃	FCCU ₃	76	0.5								Silica: 115	Startup
2/6/03	Ultracracker	ARU		0.1					5.0	1.0			Shutdown
2/6/03	Ultracracker	Flare 3		7.5				187.0					Shutdown
2/6/03	Ultracracker	Flare 1		7.5				187.0					Shutdown
2/6/03	Ultracracker	ULC Flare		96.0		400.0		600.0	700.0	50.0			Shutdown
2/4/03	FCCU ₃	Pipestill 3A Unit		0.5	1,581.0		14.0	1.4	20.8				Malfunction

BP Products North America, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/4/03	FCCU3	refinery		2.5			486.0	46.0	1,119.0		3.0		Malfunction
		Rod Tower RV 12P		0.1		562.0			3,103.0				
TOTALS				8,469.4	219,856.7	6,721.1	498,955.2	18,951.5	294,206.2	6,650.4	313.0		

BP TEXAS CITY CHEMICAL PLANT B • Texas City, Galveston County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/30/04	PCU	PCU		0.3					19.8	19.3			Malfunction
1/30/04	PCU	PX2, MX, PCU		0.5	0.0		1,155.4	108.46					Malfunction
1/25/04	T201	polybutane flare		2.2				18.55					Malfunction
1/23/04	T201 overhead	T201		2.2					624.3				Malfunction
1/9/04	Styrene Unit	Styrene Flare		24.0				146	469.0	263.0			Shutdown
10/31/03	PX2	PX2 flare		12.0					567.0	10.0			Startup
10/28/03	Heat Exchanger	PX1 flare		21.3				150					Malfunction
10/27/03	PCU	polybutane flare		4.0				35	2,187.0				Malfunction
10/22/03	Exchanger TT-206	glycol tank vent		90.0					13.0				Malfunction
10/16/03	Cogen	PX1 styrene flare		2.0				1.351	10.3				Malfunction
10/6/03	TR-5 transformer			12.0				79.8	1,972.0	1,972.0			Malfunction
10/6/03	Ultra Former	Atmospheric vent		0.0								Continuous Release - benzene	Maintenance
9/19/03	PX2	Tank 1113		48.0					4,296.0			xylene	Shutdown
9/15/03	PX2	PX2 flare		48.0				180	3,210.0	10.0			Shutdown
8/6/03	Paraxylene Unit	flare		2.0				74	2,301.0	1.0			Malfunction
7/30/03	FCCU no 2	flare 2		4.0	6,000.0			135	1,600.0				Startup
7/25/03	ARU Benzene Tower	ARU flare		12.0					16.0	16.0			Shutdown
7/15/03	Crystallizer	Flare & Venting		12.0					195.3			xylene	Maintenance
6/30/03	Styrene	styrene		8.0					320.0	20.0			Maintenance
6/24/03	MC105	flare		72.0				2.46	69.0	69.0			Shutdown
6/20/03	Block Valve	olefins #1 flare		1.0			10.4	1.4	30.0		30.0		Malfunction
6/16/03	PX2	Px2		7.0				20	600.0				Malfunction
6/12/03	Floating Roof Tank	Floating roof tank		24.0					119.8				Malfunction
5/20/03	Styrene Unit Condensor & Reboiler	Styrene Unit		216.0				100	10,000.0	10,000.0		nitrogen 2200	Maintenance
5/20/03	Storage Tank	mixed xylene storage tank		132.0					15,362.0	2,833.0		xylene	Maintenance
5/13/03	Flange	styrene		0.5					10.0	10.0			Malfunction
5/13/03	Styrene Unit	Styrene Unit Flange		0.5					10.0	10.0			Malfunction
4/29/03	PX1	FU-351		17.0					107.0	17.0		xylene	Maintenance

BP Texas City Chemical Plant B, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
3/5/03	Refrigerant Compressor	Flare		0.0				10	5,100.0				Malfunction
3/5/03	Compressor	flare		196.1				39.11	751.7				Malfunction
2/27/03	T-201	Flare		8.0				10	100.0				Malfunction
2/23/03	Paraxylene Unit No. 3	crystallizer		4.0					138.4				Maintenance
TOTALS				982.5	6,000.0	0.0	1,165.8	1,111.1	50,198.6	15,250.3	30.0		

CITGO CORPUS CHRISTI REFINERY EAST PLANT • Corpus Christi, Nueces County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/30/04	ESP Stack	Flour Flare		24.0	170.7		4,070.2	563.6	11,675.5				Startup
1/29/04	#2 FCCU	#2 FCCU ESP Stack	66	7.5									Malfunction
1/17/04	Tank 2	Tank 2 Water Draw		3.3						6.6			Malfunction
1/17/04	#2FCCU	#2 FCCU ESP Stack	43	0.2									Shutdown
1/15/04	Unibon, SRU B Train, SRU Scot Unit	SRU Incinerator		192.0	8,293.0								Maintenance
1/15/04	Regenerator	#2 FCCU ESP Stack	43	0.2									Malfunction
1/11/04	Regenerator	#2 FCCU ESP Stack	45	0.1									Malfunction
1/9/04	Unibon Unit	Flour Flare		50.0	721.0	8.0	224.7	44.1	158.0				Shutdown
1/8/04	SMSS	Cumene Flare		25.0			40.0	5.6	32.0	15.0			Shutdown
1/5/04	SRU Incinerator	SRU Incinerator Stack		0.9	2,388.0								Malfunction
1/3/04	Regenerator	#2 FCCU ESP Stack	44	0.2									Malfunction
12/27/03	Auxiliary Amine Treating System	Acid Gas Flare		73.1	7,174.0	78.0							Malfunction
12/26/03	Calpine	Flour Flare		2.4	132.5	1.1	876.9	122.7	2,488.6				Malfunction
12/25/03	CO Boiler	CO Boiler Stack	35	0.4		43.5	1,356.0		128.6				Malfunction
12/25/03	Calpine power outage	Cumene Flare		1.9			186.2	36.6	21.0				Malfunction
12/25/03	Calpine	Flour Flare		8.0	127.3	1.4	161.8	22.4	191.3				Malfunction
12/25/03	East Plant Units and Javelina	Flour Flare		1.3	266.6	2.9	257.2	50.5	96.5				Malfunction
12/25/03	OH Compressor	Flour Flare		0.2	16.8	0.2	1.4	0.2	2.1				Malfunction
12/25/03	EP SRU	SRU		3.2	323.0								Malfunction
12/25/03	Calpine	Flour Flare		7.8	121.1	1.3	117.5	16.4	259.1				Malfunction
12/18/03	Benzene cooler 18-E-70	Cooling Tower 10		13.4					7,496.0	7,496.0			Malfunction
12/12/03	CO Boiler	CO Boiler Stack	100	5.4		3.7	150.0		6.3				Malfunction
12/12/03	Calpine shutdown	Flour Flare		2.1	572.6	6.2	49.0	6.8	69.8				Malfunction
12/12/03	Calpine shutdown	SRU Incinerator		4.2	2,246.0								Malfunction
12/12/03	Calpine shutdown	Flour Flare		0.8	0.3		26.6	4.9					Malfunction

Citgo Corpus Christi Refinery East Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/12/03	Calpine	Fluor Flare		8.0	135.5	1.5	172.1		189.0				Malfunction
12/11/03	SRU SCOT Unit	SRU Incinerator		3.4	3,126.0								Malfunction
12/8/03	Alkyl Low RVP Stabilizer Overhead Condenser	Cooling Tower #7		5.0					6,234.0				Malfunction
11/18/03	Vacuum Unit Heater	Vacuum Heater Stack	100	0.4	337.0								Malfunction
10/29/03	Main Column Flaring	Fluor Flare		4.9	2,796.2	28.5	4,601.0	637.0	12,902.5				Malfunction
10/28/03	Regenerator Slide Valve	FCCU ESP Stack	100	0.3	79.0		29,198.0					Sweet gas oil: 143,386	Malfunction
10/28/03	Regenerator Slide Valve	Fluor Flare		0.8	164.6	1.8	128.0	17.7	341.8				Malfunction
10/11/03	Crude unit shutdown	Fluor Flare		3.9			254.0	49.8	103.8				Malfunction
10/4/03	Vacuum Hot Well	Fluor Flare		0.3	401.0	4.4		1.6					Malfunction
9/23/03	CO Boiler	CO Boiler Stack	100	6.7	40.0		4,708.0						Malfunction
9/23/03	CO Boiler	Fluor Flare	100	6.2	645.0		56.0	10.5					Malfunction
9/12/03	A and "B" Train Waste Heat Boilers	Incinerator Stack		5.6	7,495.0								Malfunction
9/12/03	Main Amine Regenerator	Acid Gas Flare		0.1	21.8	0.2							Malfunction
9/12/03	Sour Water Stripper	Sour Water Gas Flare		0.4	114.6	1.3						31.3 Ammonia	Malfunction
9/12/03	Hydrogen System Upset	Cumene Flare Stack		7.5				164.0					Malfunction
9/12/03	CCC Box	Fluor Flare	100	0.3									Malfunction
9/2/03	CO Boiler	#1 FCCU Boiler Stack	86	1.3			3,568.0						Malfunction
8/13/03	#1 Clark Compressor	Fluor Flare		0.1	5.0								Malfunction
8/12/03	Flow meter	Slop oil line in tank		7.7					390.0	390.0			Malfunction
8/7/03	#1 FCCU Boiler Stack	#1 FCCU Boiler Stack	64	1.9									Malfunction
8/7/03	#1 FCCU Boiler Stack	#1 FCCU Boiler Stack	39	0.0									Malfunction
7/20/03	CO Boiler Stack	#1 FCCU Boiler Stack	59	0.8									Malfunction

Citgo Corpus Christi Refinery East Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
7/13/03	CO Boiler	FCCU CO Boiler Stack	55	14.3			43,471.0						Malfunction
6/13/03	CO Boiler	#1 FCC CO Boiler Stack	83	0.8			1,644.0						Malfunction
6/12/03	CO Boiler	#1 FCCU CO Boiler Stack	80	0.4			898.0						Malfunction
5/28/03	SRU Trains	SRU Incinerator		8.4	2,383.0								Malfunction
5/26/03	SCOT Unit	SRU Incinerator		6.5	2,265.0								Malfunction
5/13/03	SRU Claus Train	SRU Incinerator		2.5	22,444.0								Malfunction
5/13/03	Unibon Unit	Fluor Flare		0.8	895.0								Malfunction
5/1/03	Compressor	Compressor C5 Stack		185.0			2,758.0	1,641.0					Malfunction
4/14/03	SCOT Heater	EP SRU Incinerator		2.9	1,648.0								Malfunction
4/12/03	Compressor Suction Scrubber	Fluor Flare		2.8	494.0								Malfunction
3/29/03	Steam Generator	CO Boiler Stack	99	120.4			366,930.0						Malfunction
3/1/03	Regenerator	CO Boiler Stack	81	3.2									Malfunction
2/28/03	Absorber Tower Bottoms	Sulfur Recovery Unit		1.2	1,071.0								Malfunction
2/18/03	Main Regeneration Level	Sour Water Gas Flare		0.5	816.1	8.9							Malfunction
2/12/03	Fractionator	Flour Flare		2.3				159.0	143.7	12.5			Malfunction
2/7/03	Regenerator	CO Boiler Stack	52	1.6									Malfunction
2/18/03	Main Regeneration Level	Acid Gas Flare		0.4	3,322.0	36.7							Malfunction
0.0													
TOTALS				846.7	73,251.7	229.6	465,903.6	3,554.4	42,929.6	7,920.1	0.0		

DOW TEXAS OPERATIONS FREEPORT • Freeport, Brazoria County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/20/04	R-44 Acetylene Reactor Beds	Elevated & Ground Flares		22.8			9,149.5	1,438.1	8,642.5	17.1	7.0		Maintenance
1/15/04	Header System from Exchanger	Relief, header system		0.1					210.0	210.0			Malfunction
12/31/03	Prop. Dryer BED.	Flare		72.0			191.0	38.0	260.0				Maintenance
12/22/03	Plant Process Adjustment	FS1000 -Ground Flare		24.0	0.05		160.0	31.0	116.0				Malfunction
12/19/03	Power Failure	FS1000		48.0	0.56		1,263.0	248.0	581.0				Malfunction
12/18/03	Ethylene Compressor	C-141-3		2.7					279.0				Malfunction
12/14/03	MB Line	Portable Flare		148.0					220.0				Maintenance
12/12/03	Well DW11	Portable Flare		14.0			325.7	163.0	600.0				Maintenance
12/11/03	Reactor R-402	Flare		24.0			45.0	9.0	67.0				Startup
11/24/03	Pipe	Fugitive		0.8								617 biphenyl; 1924 biphenyl oxide	Malfunction
11/17/03	Cyclone	Flare		48.0	0.00		170.0	34.0	242.0				Startup
11/10/03	Liquefaction Plant Compressor	Tailgas Line		1.9								87.2 Chlorine	Malfunction
10/25/03	Reactor Hydraulic Pump	Reactor		0.0					576.0				Malfunction
10/25/03	R-401 Reactor	Y 702 Drying Bed Flare		96.0	0.20		687.0	135.0	595.0				Malfunction
10/24/03	Refrig. Sys.	Leak		24.0								HCFC 2300 lbs	Malfunction
10/23/03	Reactor Ground Flare	Flare		25.3					28,385.0	24.1	10.0		Malfunction
10/23/03	R-45	Elevated Flare		25.3			3,533.8	504.5	4,583.7	3.9	1.6		Malfunction
10/23/03	R-45	Ground Flare		25.3			21,882.9	3,124.5					Malfunction
10/9/03	Reactor	Flare		120.0			1,345.0	263.0	1,375.0				Malfunction
10/8/03	R-60A	Flare		1.0					103.5	0.5	0.1		Malfunction
10/7/03	Prop. Dryer Bed	Flare		24.0	0.15		297.0	58.0	98.0				Maintenance
10/4/03	Extruder	Flare		24.0	0.52		1,275.0	250.0	698.0				Malfunction
10/3/03	Well BW-37	Portable Flare		9.0					450.0				Maintenance
10/2/03	Polyethylene #4 Plant Compressor	Vent		0.0					1,900.0				Malfunction
9/29/03	Ethylene Drying Bed	Vent		10.0					133.0				Malfunction

Dow Texas Operations Freeport, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/26/03	Extruder	Flare		24.0	0.02		172.0	34.0	220.0				Malfunction
9/15/03	R-401 Reactor	Flare		24.0	0.98		358.0	70.0	310.0				Malfunction
9/12/03	Hydrogen Drying System Temperature Transmitter	Flare		3.8			1,046.9	145.0	1,473.1				Malfunction
9/10/03	Prop Drying Bed	Flare		72.0	0.32		779.0	153.0	428.0				Malfunction
9/2/03	C-201 Compressor	Leak		0.0				22.8	1,900.0				Malfunction
8/19/03	Prop. Bed	Flare		96.0	0.33		878.0	172.0					Maintenance
8/19/03	Propane Bed	Flare		102.0					533.0				Maintenance
8/18/03	Compressors C-301 A/B	Flare		14.0	0.60		152.0	30.0	82.0				Startup
8/16/03	Quench Pump	Fugitive Area No. 2		0.3					274.0			Vinyl chloride 372.7	Malfunction
8/11/03	Lt. Hydro-Carbon	Flare FS-1000		24.0	0.05		185.0	36.0	150.0				Malfunction
8/11/03	Ethylene Recovery System	Ground Flare		1.1			150.2	20.8					Malfunction
8/4/03	Reactor	Fugitive		52.0					52.2	52.2			Maintenance
8/3/03	Y-702 B&D Regen	Ground Flare		72.0	0.17		483.9	95.0					Malfunction
8/3/03	Y-702 Regen.	Flare		24.0					528.0				Malfunction
8/1/03	R-402	Flare		24.0	0.03		328.0	64.0	419.0				Maintenance
7/31/03	C-20 (lightening)	Vent		0.1					1,100.0				Malfunction
7/23/03	Flare	Flare		0.9			0.4		24.9	0.1	0.4		Malfunction
7/13/03	Plant Wide	Flare		192.0	0.60		2,204.0	433.0	1,928.5				Maintenance
7/10/03	AR-1 Pressure Transmitter	Fugitives		0.3					99.2	99.2			Malfunction
7/10/03	T-100 Overhead	Leak		4.3								Epichlorohydrin 750	Malfunction
7/7/03	Oil Sep. Line	Leak		74.8								5950 Freon	Malfunction
7/6/03	Filter	Flare		24.0	0.01		318.9	62.6	453.1				Malfunction
6/21/03	C-501 Replacement	Flare		336.0	3.02		7,180.0	1,409.0					Startup
6/13/03	Reactor Rupture Disks	Fugitive		0.1					17,331.0			Acrylic Acid 454	Malfunction
6/11/03	Refrig Unit	Fugitive		100.0								957 R-134 A Refrig	Malfunction
6/9/03	Power Out	Flare		48.0	0.01		176.0	36.0	126.0				Malfunction
6/7/03	Exchanger Inlet Expansion Joint	Fugitive		0.0					138.3			Vinyl Chloride .052	Malfunction

Dow Texas Operations Freeport, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/7/03	R-216 Reactor	Vent		0.1					441.0				Malfunction
5/30/03	Huntsman Plant Upset	Leak		24.0	0.00		0.9	52.6	0.8				Malfunction
5/19/03	Reactor	Flare		240.0	0.19		1,630.6	320.0					Malfunction
5/18/03	C145B Suction Valve	C-145B Suction Valve		0.2					1,070.0				Malfunction
5/16/03	HPS	Vent		0.0					2,353.0				Malfunction
5/14/03	Hyper-Comp. C-101	Vent		0.0					1,500.0				Malfunction
5/3/03	Throx (upset at Hunstman)	Chloropyridine		1.0	0.00		0.5	22.8	0.3				Malfunction
4/21/03	Plant Wide	Flare		216.0			1,887.0	370.0	1,583.0				Maintenance
4/20/03	Reactor	Flare		0.0					400.0				Malfunction
4/19/03	Gas Pipe	Leak		2.0					540.5				Malfunction
4/7/03	High Pressure Separator	Vent		34.0									Malfunction
4/6/03	Reactor	Vent Stack		0.0					1,900.0				Malfunction
4/3/03	Valve	Leak		0.0					1,202.0				Malfunction
4/2/03	Catalyst Complex Spill	Catalyst Complex Recycle Pump		0.1					31.5	31.5			Malfunction
3/31/03	Plant	Process Vent	5%	0.8									Startup
3/30/03	C-10 Compressor	Flare		5.1					4,745.5	94.9	115.0		Malfunction
3/20/03	Furnace	Elevated & Ground Flares		3.6			3,175.9	439.7	4,467.1				Malfunction
3/18/03	AD-4122	Scrubber		9.5					37.3	37.3			Malfunction
3/17/03	R-101	Valve		0.3					63.0				Malfunction
3/13/03	C-10 Compressor	Elevated & Ground Flares		15.0			68,047.6	11,015.5	67,542.7	1,813.8	1,280.6		Malfunction
3/12/03	BG400 Reactor	Vent		1.8					5,795.0				Malfunction
3/8/03	Leaking Line	Leak		1.7					345.0	15.0	8.0		Malfunction
3/5/03	Steam Shortage	Flare		28.5			40,064.5	5,604.7	35,749.2	161.7	307.5		
2/24/03	Compressor	Flare	21%	0.8			1,690.8	282.0					Malfunction
2/24/03	LHC Facility	Flare		528.0			5,306.0	1,041.2	6,952.0				Startup
2/17/03	Plant	Flare	5%	1.7									Startup
2/13/03	C-20	Elevated Flare	15%	127.7		3.4	42,480.9	7,081.1	272,944.3	2,204.7	1,621.9	Biphenyl: 1111.9; H: 2164.5	Malfunction
2/9/03	C-10 Compressor			10.9			6,537.5	905.0	5,897.0	180.3	218.4		Malfunction

Dow Texas Operations Freeport, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/1/03	R-203A	Vent		0.4								Epichlorohydrin 250	Malfunction
Unknown	C-20	Ground Flare	15%	0.0		9.0	83,476.9	16,516.5	85,351.8	6,226.8	4,538.4	Biphenyl: 3201.1; H: 7384.7	Malfunction
TOTALS				3,357.0	7.81	12.4	309,036.3	52,730.4	781,596.9	11,172.9	8,108.9		

EQUISTAR CHEMICALS CHANNEL VIEW COMPLEX • Cannelview, Harris County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/20/04	decoking motor	F3415 MOV		0.2						1	2.0		malfunction
1/19/04	quench exchanger	F4415		0.9					11.0	4	7.0		malfunction
12/24/03	tank 4455	tank 4455		4.8					557.0	6			malfunction
12/20/03	compressor			1.8								275 freon	malfunction
12/17/03	hydrogen valve	OP2 Flare		0.3			1,600.0	231.0	1,900.0				malfunction
12/14/03	MAPD converter	OP1 flare		2.3			1,800.0	232.0	2,630.0			liquid ethylene: 7	malfunction
12/11/03	lube oil turbine	flare		4.8			8,500.0	1,160.0	11,803.0	1,000	590.0		malfunction
12/11/03	pipeline	OP2 flare		0.1			150.0	29.5					malfunction
12/8/03	propane bullet	OP2 flare		2.3			1,400.0	210.0	2,100.0				malfunction
11/24/03	OPI startup	OP1 flare		216.5					6,800.0				startup
11/13/03	pressure valve	OP1 flare		113.8			750.0	145.0					malfunction
11/12/03	OPI startup	OP1 flare	25%	216.5			8,000.0	1,160.0	7,562.0	10.0	30.0	Hydrogen: 700	startup
11/8/03	pipeline repair	OP2 flare		6.9			200.0	2,320.0				Hydrogen: 6600	maintenance
10/22/03	tank	east plant flare		11.0				50.0	1,428.0		7.0		malfunction
10/18/03	refrigerant system	olefins flare		0.5			340.0	50.0	480.0				malfunction
10/13/03	tank	relief valve		70.0					7,980.0		80.0		malfunction
10/12/03	OPI unit	OP2 flare		22.1			1,600.0	450.0				Hydrogen: 500	shutdown
10/11/03	feed line	OP1 flare		8.0				50.0	300.0	100			malfunction
10/6/03	OPI turnaround	paiting activity fugatives		1,048.0					3,050.0	400.0		Particulate Matter: 150;	shutdown
10/6/03	OP1 unit	TK-3455		312.0				42.0	15.0				maintenance
10/2/03	heat exchanger	OP1 cooling tower		10.8					4,326.0				malfunction
10/2/03	recovery tower	recovery tower		1.5					7,154.0	43			malfunction
10/1/03	OPI flare tip	OP2 flare		912.0			175.0	26.0	116.0	50.0			maintenance
9/30/03	acetylene converter	OP2 flare		0.1			172.0	24.0	194.0				malfunction
9/30/03	compressor	compressor c-3202		0.8								360 freon	malfunction
9/30/03	C4 recovery	East plant flare		20.0			21.0	3.0	60.0		60.0		shutdown
9/30/03	OPI deinventory	OP1 flare	25%	340.0			5,800.0	810.0	4,801.0	1.0	10.0		shutdown
9/28/03	OPI-decoking	D-3422		125.0			15,000.0					Particulate Matter: 500	shutdown
9/20/03	charge gas compressor	OP2 flare		48.0			400.0	75.0	42.0	1.0	4.0		

Equistar Chemicals Channel View Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/14/03	C-4 tower	east plant flare		69.8			360.0	50.0	1,075.0		455.0	acetonitrile: 180	shutdown
9/1/03	tank 3	PSV-o8145		0.1					6,986.0		1,511.0		malfunction
8/28/03	F-4405 heater	F-4405 heater	15	0.3									malfunction
8/25/03	pressure valve	OP1 flare		24.0				60.0	840.0				malfunction
8/19/03	tank 3912	tank 3912		181.0			85.0	20.0	630.0	200	3.0	Liquid Ethylene: 6; Hydrogen: 55	malfunction
8/12/03	cooling tower leak	OP1 colling tower		1,536.0					22,480.0	4,650	150.0	chloroform: 800	malfunction
8/8/03	instrument loss	OP2 flare		50.4			5,555.0	792.0	7,970.0	688	526.0	Hydrogen:247	malfunction
7/22/03	MAPD converter	OP1 flare		0.3			260.0	37.0	380.0				malfunction
7/20/03	valve	misc. fugitive sources		0.3					120.0		20.0		malfunction
7/18/03	tank 3912	tank3912		13.5					110.0	50			malfunction
7/15/03	a-train	OP2 flare		0.1				30.0	300.0		35.0		startup
7/11/03	loading rack	Tk-401 caustic wash		0.4					641.0			186 sulfuric acid	malfunction
7/10/03	3701 reactor	R-3701		0.1					82.8	0.2			malfunction
7/5/03	relief valve	OP1 flare		2.0			130.0	30.0	400.0				malfunction
6/28/03	c-4 tower	East plant flare		8.3			12.0	3.0	35.0		35.0		startup
6/23/03	vent compressor	East plant flare		107.0			7,835.0	1,540.0	22,320.0		11,420.0		malfunction
6/23/03	flex-c train	OP1 flare		18.0			592.0	82.0	859.0				malfunction
6/18/03	heat exchanger	East plant cooling tower		9.0					4.0		4.0	acetonitrile: 2000	malfunction
6/18/03	flex unit dimer loop	OP2 flare		24.0				20.0	408.0				shutdown
6/1/03	refrigerant copmressor	East plant flare		15.0			60.8	7.8	126.0				malfunction
5/28/03	OPI Flare	OP1 flare		2.6					242.0	55	10.0		malfunction
5/26/03	heat exchanger	OP2 cooling tower		52.5					3,070.0				malfunction
5/23/03	feed pump	flare		1.2			1,000.0	150.0	1,480.0				malfunction
5/17/03	heat exchanger	OP2 cooling tower		5.0					3,000.0				malfunction
5/16/03	OPI flare pilot	OP1 flare		4.0					214.0	50	8.0		malfunction
5/7/03	temp. indicator	OP2 flare		2.5			900.0	125.0	1,300.0				malfunction
5/5/03	MAPD converter	OP1 flare		0.1			100.0	15.0	145.0				malfunction
5/5/03	pump P-4350	OP2 flare		2.0			500.0	64.0	720.0				malfunction
5/2/03	OP2 piping	Op2 flare		1.3			4,000.0	600.0	5,000.0				malfunction
5/1/03	CH startup	East plant flare		72.0			40.0	10.0	55.0		45.0		maintenance

Equistar Chemicals Channel View Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
4/28/03	OP2 compressor	olefins flare		0.1			345.0	50.0	425.0	70	40.0	liquid ethylene: 140	malfunction
4/19/03	exchanger	OP2 flare		1.3			460.0	90.0	850.0				malfunction
4/10/03	OP2 turnaround	OP2 flare		470.0			40,000.0	5,000.0	69,000.0		1,000.0		malfunction
4/10/03	OP2 Unit	4.80E+02	4%	480.0			30,000.0	4,000.0	24,600.0	600.0	300.0		startup
4/6/03	distillation tower	East plant flare		0.1				22.0	325.0		130.0		malfunction
3/24/03	equistar tank-3910	OP1 flare		2.2			13.0	3.0	39.0		19.0		malfunction
3/19/03	reboiler inlet	benezene		0.7					238.0	68		C9 aromatics: 19; C9+: 47	malfunction
3/19/03	PSV-40112	olefins 1 flare		16.0				11.0	234.0	54		C9 aromatics: 1	malfunction
3/15/03	tank-3910	olefins 1 unit		9.3			78.0	15.0	233.0		97.0		malfunction
3/13/03	painting through plant	painting through plant		1,152.0					1,600.0	200.0		particulate matter: 100;	maintenance
3/11/03	c-5 recovery unit	C5 recovery unit		169.3			270.0	60.0	775.0				startup
3/10/03	olefins unit 2	olefins unit 2		120.0								mercury: 1.6	malfunction
3/10/03	alky flare	flare		0.0				2.0	25.0				malfunction
3/7/03	OP2 unit	tank 48104		12.0					10.0				maintenance
3/6/03	methanol unit	OP1 flare		8.0			2,018.0	163.0					startup
3/3/03	tank 3911	tank 3911		14.1					10.0	2.0			malfunction
3/1/03	C4-C5 recovery unit	C4-C5 recovery unit		1,080.0						5,000.0			shutdown
2/16/03	OP2 turnaround	OP2 flare		353.0			17,200.0	3,400.0	25,008.0	890.0	225.0		shutdown
2/15/03	Op2 unit	OP2 unit		1,176.0			15,000.0					Particulate Matter: 500	shutdown
2/15/03	OP2 hydroblast	hydroblasting and vessel opening		312.0					2,000.0				maintenance
2/15/03	tank 4455	TK-4455		533.0				35.0	315.0	40.0			maintenance
2/15/03	c-4 west train	C4 recovery unit	21%	74.8			345.0	50.0	1,055.0		840.0		shutdown
2/14/03	hydrogen stream	OP1/OP2		1.8			20.0	65.0					malfunction
2/12/03	hydrogen stream	OP1/OP2		1.9			30.0	85.0					malfunction
2/3/03	A train	OP2 flex unit		6.0				50.0	500.0				startup
TOTALS				11,696.8	0.0	0.0	173,116.8	23,804.3	271,543.8	14,233.2	17,663.0		

EQUISTAR CHEMICALS CHOCOLATE BAYOU COMPLEX • Alvin, Brazoria County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/30/04	Olefins	Main Flare		0.3			218.0	31.0	257.0				Malfunction
01/06/04	Boiler	Main Flare		0.4			86.0	12.2	121.0	7	16.0		Malfunction
12/09/03	Boiler	Main Flare		7.5			134.0	50.0	192.0	22	24.0	Hydrogen: 123	Malfunction
12/09/03	Boiler	Hydrocarbons Flare		17.5			221.0	55.0	651.0		106.0	Hydrogen: 99	Malfunction
11/24/03	391H1-1	olefins flare		9.7			1,516.0	210.0	2,080.0	66	142.0		Malfunction
11/24/03	Boiler	hydrocarbons flare		77.7			312.0	43.2	167.0		75.0		Malfunction
11/02/03	Olefins	Main Flare		0.8			87.0	12.0	120.0		8.0	Hydrogen: 1	Malfunction
10/06/03	Exchangers 95E7 1&2	Olefins Flare		269.5			1,728.0	239.0	2,160.0		160.0		Malfunction
10/4/03	Hydrogen System	Main Flare		0.3			199.5	27.6	289.0				Malfunction
10/02/03	Boiler	Main Flare		30.4			40,560.7	5,615.8	55,823.0	2,652	6,702.0		Malfunction
10/02/03	Boiler	Hydro Flare		44.4			1,043.6	144.5					Malfunction
09/29/03	93A2	Main Flare		48.2			28.0	4.3	1.0			Hydrogen: .5	Startup
08/20/03	Ethylene Compressor	Olefin Flare		35.9			16,617.0	2,301.0	21,692.0	438	857.0		Malfunction
08/18/03	PSV	Hydrocarbons Flare		2.3			16.3	2.3	47.0		19.0		Malfunction
7/15/03	Boiler	Hydro Flare		39.8			661.0	92.0					Malfunction
07/15/03	Boiler	Main Flare		74.6			10,171.0	1,409.0	13,680.0	711	868.0		Malfunction
07/02/03	Ethylene Reactor	Olefins Flare		1.0			884.0	124.0	1,043.0				Malfunction
05/21/03	80D16	Hydrocarbons Flare		0.5			38.0	6.0	140.0		140.0		Malfunction
04/24/03	Olefins	Main Flare		120.0			20,608.0	2,853.0	25,288.0	105	305.0		Startup
4/14/03	Hydrocarbons & Olefins	Hydrocarbons Flare		248.1					786.0	252	108.0		Malfunction
4/14/03	Hydrocarbons & Olefins	Olefins Flare		0.0			6,157.0	853.0	8,197.0	182	576.0		Malfunction
03/23/03	Steam Gen. Facility	Steam Gen. Facility		0.2								Halon: 300	Maintenance
TOTALS				1,277.2	0.0	0.0	101,286.1	14,084.9	132,734.0	4,435.0	10,106.0		

EQUISTAR CHEMICALS LA PORTE COMPLEX • Deer Park, Harris County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/28/03	AB3	AB3 Flare		10.0					0.2				Malfunction
12/13/03	Olefins	QE1 process vents to main flare		60.0					8,149.8	0		Hydrogen: .3; C3s: .1	Startup
12/13/03	Olefins	QE1 Elevated Flare		0.0			11,365.0	2,186.0					Startup
12/13/03	Olefins	ARU Flare 3050B		0.0			446.0	85.4					Startup
12/13/03	Olefins	Acetylene Recovery Unit Vents		0.0					705.3				Startup
12/11/03	PGC	Elevated Flare		27.0			10,492.0	1,995.0	226.0				Malfunction
12/11/03	PGC	QE1 Unit		0.0					7,088.1	152	184.0	C3s - 131	Malfunction
12/11/03	PGC	Acetylene Recovery Unit Vents		27.0					226.0				Malfunction
12/11/03	PGC	ARU Flare		0.0			119.0	22.7					Malfunction
12/9/03	Q1 Unit	HS Flare		48.2			271.0	47.7	509.1			Hydrogen: 1	Startup
12/6/03	ABIII	AB3 Unit		0.0					461.0				Shutdown
11/29/03	ABIII	AB3 Unit		0.0					934.0				Malfunction
11/24/03	ABIII	AB3 Unit		0.0					934.0				Malfunction
11/21/03	Olefins depropanizer	QE1 Elevated Flare		14.5			3,501.0	674.0					Malfunction
11/21/03	Olefins Depropanizer	QE1 Unit Process Vents		0.0					3,294.0			Misc. C3: 73	Malfunction
11/18/03	RV3025	UT Ethylene Meter Station Fugitives		0.0					533.0				Malfunction
11/9/03	Pv-5303	UT Ethylene Meter Station Fugitives		0.1					8,648.0				Malfunction
11/9/03	Secondary Compressor	AB3 Unit Vents		0.0					892.0			VTMOS: 19	Malfunction
11/6/03	Secondary Compressor	AB3 Unit		0.0					892.0			VTMOS: 19	Malfunction
11/4/03	ARU Recycle Blower	ARU Vent		3.0					93.2				Maintenance
11/4/03	ARU Recycle Blower	ARU Flare 3050B		0.0			63.0	11.1					Maintenance
10/28/03	AB3	AB3 Unit		14.0					1,016.5				Malfunction
10/8/03	Reactor	Q1 Flare		2.6			117.1	20.6					Malfunction
10/8/03	Reactor	HS Flare		18.5					298.0			Hydrogen: 1	Malfunction
9/30/03	RV3025	UT Ethylene Meter Station Fugitives		0.1					3,504.0				Malfunction

Equistar Chemicals La Porte Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/15/03	Q1	HS Flare		19.2			95.0	17.0					Startup
9/15/03	Q1	HS Flare		19.2					233.0			Hydrogen: 1	Startup
9/6/03	Q1	Q1 Process Flare		48.0					405.0				Startup
9/5/03	Q1	Q1 Flare		67.6			155.1	27.4					Startup
9/1/03	6403-RV1	Relief Valve		2.5					1,280.0		599.0		Malfunction
9/1/03	6403-RV1	Elevated Flare		2.7			342.5	60.3					Malfunction
8/29/03	Q1	Q1 Flare		27.7					641.0			Hydrogen: 3	Startup
8/29/03	Q1	Q1 Flare		0.0			305.0	54.0					Startup
8/14/03	Olefins	Main Flare		245.0					5,402.0	8	20.0	Hydrogen: 352	Startup
8/14/03	Olefins	ARU		0.0					773.0				Startup
8/14/03	Olefins	ARU Flare 3050B		0.0			572.0	101.0					Startup
8/14/03	Olefins	QE1 Elevated Flare		0.0			8,796.0	1,692.0					Startup
7/16/03	Q1 Gas Phase Reactor	Q1 Process		0.1					6,911.0			Hydrogen: 24	Malfunction
7/11/03	Reactor	HS Flare		23.2					227.0				Malfunction
6/27/03	AB3 Reactor	AB3 Unit		0.0					1,316.0			Particulate Matter: 163	Malfunction
6/18/03	Olefins	Acetylene Recovery Unit Vents		7.9					577.0				Maintenance
6/18/03	Olefins Cooling Tower	Chlorine cylinder		0.2								Chlorine: .21	Malfunction
6/7/03	Olefins Unit	ARU Flare 3050B		968.0			324.0	57.0					Shutdown
6/7/03	Olefins Unit	Acetylene Recovery Unit Vents		0.0					372.0				Shutdown
6/7/03	Olefins Unit	QE1 Elevated Flare		0.0			14,703.0	2,827.0					Shutdown
6/7/03	Olefins Unit	QE1 Process Vents to Main Flare		0.0					12,964.0	71	114.0		Shutdown
5/15/03	Secondary Compressor	AB3 Flare		0.3					3.5				Malfunction
5/9/03	Olefins Furnaces	QE1 Elevated Flare		3.5			244.0	47.0	229.0		9.0		Malfunction
5/5/03	Q1	Flare		20.1			114.1	20.1	297.0				Shutdown
4/24/03	Secondary Compressor	AB3 Unit		0.2					721.0			Particulate Matter: 88	Malfunction
4/24/03	Secondary Compressor	AB3 Unit		0.0					809.0				Malfunction
4/13/03	RV 3030	UT Ethylene Meter Station Fugitives		19.5					20,272.0				Malfunction

Equistar Chemicals La Porte Complex, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/12/03	AB3	AB3 Flare		6.0			59.0	11.0	107.0				Maintenance
2/9/03	Q1	Q1 Polyethylene		48.0			559.1	98.4	1,000.0				Startup
TOTALS				1,753.8	0.0	0.0	52,642.9	10,054.7	97,943.7	231.3	926.0		

EXXON MOBIL BAYTOWN FACILITY • Baytown, Harris County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/21/04	control valve	flare 11		4.7	2.0		110.0	21.0	35.0				malfunction
1/21/04	control valve	flare 14		0.0	2.0		110.0	21.0	35.0				malfunction
1/17/04	cold feed unit	flare 3		1.0	515.0	6.0	72.0	15.0	141.0				malfunction
1/17/04	cold feed unit	flare 4		0.0	515.0	6.0	72.0	15.0	141.0				malfunction
1/17/04	cold feed unit	flare 5		0.0	515.0	6.0	72.0	15.0	141.0				malfunction
1/17/04	cold feed unit	flare 6		0.0	515.0	6.0	72.0	15.0	141.0				malfunction
1/12/04	compressor C-74	safety CLO-369		0.2					747.0				malfunction
1/2/04	hydroformer	flare 26		1,329.0	5,479.0	2.0	86,196.0	2,268.0				total sulfur: 105	maintenance
12/30/03	metering station 60	metering station 60		3.0					1.0				malfunction
12/29/03	Baytown olefins plant steam system	flare 26		175.7	3,930.0	1.0	61,827.0	1,626.0				total sulfur: 75	malfunction
12/29/03	Baytown olefins plant steam system	flare 3		0.0	5.4	0.1	262.0	46.0	424.0				malfunction
12/29/03	Baytown olefins plant steam system	flare 4		0.0	5.4	0.1	262.0	46.0	424.0				malfunction
12/29/03	Baytown olefins plant steam system	flare 5		0.0	5.4	0.1	262.0	46.0	424.0				malfunction
12/29/03	Baytown olefins plant steam system	flare 6		0.0	5.4	0.1	262.0	46.0	424.0				malfunction
12/26/03	D-801 vent	D-801 vent		5.3		522.0			5,111.0				malfunction
12/25/03	flare gas compressor C-2	C-2 atmospheric vent		0.1		3.0			709.0				malfunction
12/25/03	gas recovery compressor C-2	flare 15	100	1,014.0	4,616.0	50.0	8,709.0	1,559.0	21,589.0				maintenance
12/25/03	gas recovery compressor C-2	flare 16	100	0.0	4,616.0	50.0	8,709.0	1,559.0	21,589.0				maintenance
12/20/03	flare 20 pilot	flare 20		0.8					98.0				malfunction
12/9/03	hydrogen compressor drum	flare 17		0.2	0.1		161.0	30.0	3.0				malfunction
12/9/03	hydrogen compressor drum	flare 20		0.0	0.1		161.0	30.0	3.0				
11/26/03	gas compressor recovery C-001	flare 17		672.4	0.8		10,393.0	1,910.0	14,368.0				maintenance

Exxon Mobil Baytown Facility, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/26/03	gas compressor recovery C-001	flare 20		0.0	0.8		10,393.0	1,910.0	14,368.0				maintenance
11/25/03	C boiler shell	FCCU3C Boiler shell		303.5	1,290.0			291.0				PM: 392; SO ₃ : 22	malfunction
11/19/03	pilot gas flow	flare 17		0.5		0.0			1,927.0				malfunction
11/18/03	flare gas recovery compressor	flare 17		44.3			1,446.0	266.0	1,999.0				malfunction
11/18/03	flare gas recovery compressor	flare 20		0.0			1,446.0	266.0	1,999.0				
11/15/03	pipe still 8	flare 26		160.0	2,422.0	1.0	38,095.0	1,002.0				sulfur: 46	maintenance
11/10/03	CLEU2 twr T-7	flare 3	100%	34.5	5,930.0	64.0	827.0	151.0	1,625.0				malfunction
11/10/03	CLEU2 twr T-7	flare 4	100%	0.0	5,930.0	64.0	827.0	151.0	1,625.0				malfunction
11/10/03	CLEU2 twr T-7	flare 5	100%	0.0	5,930.0	64.0	827.0	151.0	1,625.0				malfunction
11/10/03	CLEU2 twr T-7	flare 6	100%	0.0	5,930.0	64.0	827.0	151.0	1,625.0				malfunction
10/24/03	compressor	flare 17		6.8	2.0		696.0	128.0	962.0				malfunction
10/24/03	compressor	flare 20		0.0	2.0		696.0	128.0	962.0				malfunction
10/18/03	pump seal	J4A pump seal		0.3					346.0				malfunction
10/16/03	flexicoker	flare 26		637.0	18,857.0	7.0	296,643.0	7,801.0				sulfur: 360	maintenance
10/13/03	flexicor unit	flare 25		134.1	59,348.0	643.0	6,065.0	1,115.0	8,021.0				malfunction
10/13/03	flexicor unit	flare 26\		0.0	48,727.0	528.0	6,366.0	1,171.0	17.0				malfunction
10/13/03	flexicor unit	WHB 301 bypass stack		0.0	1.0		101.0	553.0	29.0				malfunction
10/7/03	pipe still 8	flare 17		0.2	78.0	2.0	105.0	19.0	261.0				malfunction
10/7/03	pipe still 8	flare 20		0.0	78.0	2.0	105.0	19.0	261.0				malfunction
10/1/03	compressor C-74	atmospheric safety valve CI 0352		4.3					7,589.0				malfunction
10/1/03	compressor C-74	atmospheric safety valve CI 0369		0.0					411.0				malfunction
10/1/03	compressor C-74	flare 17		0.0	127.0	2.6	870.0	160.0	1,203.0				malfunction
10/1/03	compressor C-74	flare 20		0.0	127.0	2.6	870.0	160.0	1,203.0				malfunction
10/1/03	compressor C-74	flare 3		0.0	1,766.0	19.0	628.0	116.0	1,500.0				malfunction
10/1/03	compressor C-74	flare 4		0.0	1,766.0	19.0	628.0	116.0	1,500.0				malfunction
10/1/03	compressor C-74	flare 5		0.0	1,766.0	19.0	628.0	116.0	1,500.0				malfunction
10/1/03	compressor C-74	flare 6		0.0	1,766.0	19.0	628.0	116.0	1,500.0				malfunction
9/18/03	fluid catalytic cracking unit 2	FCCU2 wet gaas scrubber bypass		6.6	1.0		1,156.0	1.1	4.0			PM: 31	malfunction

Exxon Mobil Baytown Facility, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/18/03	fluid catalytic cracking unit 2	flare 3	100%	0.0	582.0	6.0	154.0	28.0	342.0				malfunction
9/18/03	fluid catalytic cracking unit 2	flare 4	100%	0.0	582.0	6.0	154.0	28.0	342.0				malfunction
9/18/03	fluid catalytic cracking unit 2	flare 5	100%	0.0	582.0	6.0	154.0	28.0	342.0				malfunction
9/18/03	fluid catalytic cracking unit 2	flare 6	100%	0.0	582.0	6.0	154.0	28.0	342.0				malfunction
9/15/03	pipe still 8	flare 20	100	3.6	6.0		0.5		0.3				malfunction
9/15/03	pipe still 8	flare 17	100	0.0	6.0		0.5		0.3				malfunction
9/15/03	pipe still 8	flare 3	100	0.0	800.0	34.0	207.0	38.0	461.0				malfunction
9/15/03	pipe still 8	flare 4	100	0.0	800.0	34.0	207.0	38.0	461.0				malfunction
9/15/03	pipe still 8	flare 5	100	0.0	800.0	34.0	207.0	38.0	461.0				malfunction
9/15/03	pipe still 8	flare 6	100	0.0	800.0	34.0	207.0	38.0	461.0				malfunction
9/3/03	coke handling	flare stack 25	100%	24.0	9,250.0	100.0	666.0	132.0	250.0				malfunction
9/3/03	coke handling	flare stack 26		0.0	24,903.0	270.0	3,195.0	587.0					malfunction
9/3/03	refinery	flare 25	100	336.0	4,625.0	50.0	333.0	61.0	125.0				maintenance
9/3/03	refinery	flare 26	100	0.0	4,625.0	50.0	333.0	61.0	125.0				maintenance
8/29/03	wet gas compressor	flare stack 27		4.1	40,798.0	438.0	1,408.0	259.0	2,097.0				malfunction
8/14/03	waste heat boiler	GTG 301 bypass stack		535.0	41.0	0.5	4,227.0	27,873.0					maintenance
8/8/03	sour gas compressor	flare 25	10%	0.7	2,581.0	28.0	208.0	38.0	204.0				malfunction
8/8/03	gas turbine generator	WHB71		0.8	4.0		9.0	151.0	0.3				malfunction
8/8/03	gas turbine generator	WHB72		0.0	4.0		9.0	69.0	0.3				malfunction
8/8/03	gas turbine generator	WHB74		0.0	4.0		7.0	154.0	0.3				malfunction
7/27/03	gasket	dock line 17 flange		1.0					150.0	150			malfunction
7/21/03	gas compressor	flare stack 15		1.4	874.0	9.0	28.0	6.0	112.0				malfunction
7/15/03	compressor	flare 17		14.7	203.0	2.0	72.0	14.0	184.0				malfunction
7/15/03	compressor	flare 20		0.0	203.0	2.0	72.0	14.0	184.0				malfunction
7/12/03	crude unit	flare stack 27		51.3	86,406.0	937.0	1,634.0	130.0	2,602.0				malfunction
7/11/03	tower T-501	flare 3	100%	0.2	365.0	4.0	8.0	1.5	21.0				malfunction
7/11/03	tower T-501	flare 4	100%	0.0	365.0	4.0	8.0	1.5	21.0				malfunction

Exxon Mobil Baytown Facility, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
7/11/03	tower T-501	flare 5	100%	0.0	365.0	4.0	8.0	1.5	21.0				malfunction
7/11/03	tower T-501	flare 6	100%	0.0	365.0	4.0	8.0	1.5	21.0				malfunction
7/11/03	compressor	tank vent		2.5	2.0				1,959.0				malfunction
6/26/03	dc rude unit	flare 27		87.0	106,217.0	1,152.0	2,295.0	212.0	3,198.0				maintenance
6/18/03	compressor C-30	CLO522		0.0		7.0	65.0		3,246.0				malfunction
6/6/03	sulfur conversion unit	incinerator F529		6.8			69.0	13.0	25.0				maintenance
5/23/03	booster & feed pump	flare 15	100	0.1									malfunction
5/23/03	booster & feed pump	flare 16	100	0.0									malfunction
5/7/03	compressor C-30	flare 11		16.1	9,161.0	100.0	1,372.0	250.0	3,008.0	9	12.0		malfunction
5/7/03	compressor C-30	flare 14		0.0	9,161.0	100.0	1,372.0	250.0	3,008.0	9	12.0		malfunction
5/7/03	compressor C-30	flare 3		0.0	654.0	7.0	5,172.0	361.0	3,208.0		23.0		malfunction
5/7/03	compressor C-30	flare 4		0.0	654.0	7.0	5,172.0	361.0	3,208.0		23.0		malfunction
5/7/03	compressor C-30	flare 5		0.0	654.0	7.0	5,172.0	361.0	3,208.0		23.0		malfunction
5/7/03	compressor C-30	flare 6		0.0	654.0	7.0	5,172.0	361.0	3,208.0		23.0		malfunction
4/1/03	steam condensate system	tank 1443 vent		21.0					17.0	17		naptha: 155	malfunction
4/1/03	steam condensate system			0.0					17.0	17		naptha: 155	malfunction
3/26/03	CLO-369	CLO-369		5.0					24,954.0		195.0		malfunction
3/3/03	compressor C-74	CLEU 3		0.0					1,818.0				malfunction
2/27/03	flare seal	flare 17		1.0					155.0				malfunction
2/27/03	flare seal	flare 18		0.0					155.0				malfunction
2/17/03	gas turbine generator 44	gas turbine generator 44		1.0				117.0					malfunction
2/15/03	gas line	flare 15		42.0	53,373.0	579.0	1,447.0	80.0	2,043.0				malfunction
2/15/03	gas line	flare 27		0.0	53,373.0	579.0	1,447.0	80.0	2,043.0				malfunction
2/15/03	jet vent gas line	hole in jet vent		42.0		34.0	1.0		119				malfunction
2/12/03	MEA unit	flare 19		5.8	320.0	3.0	60.0	11.0					malfunction
2/12/03	MEA unit	flare 19		5.8	320.0	3.0	60.0	11.0					maintenance
2/9/03	refinery gas system	flare 15		7.0	120.0	1.0							malfunction
TOTALS				5,753.7	598,756.3	6,821.1	591,139	57,613.1	188,537.5	202.0	311.0		

EXXON MOBIL CHEMICAL BAYTOWN OLEFINS • Baytown, Harris County TX
Emissions Data (Lbs./Event): 1.31.03 - 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/30/04	Prism Unit	primary flare		0.8			102.0	39.0					Malfunction
1/7/04	PRU propylene refrigeration compressor	primary flare		7.2					2,914.0				Malfunction
1/7/04	PRU propylene refrigeration compressor	secondary flare		7.2					4,152.0				Malfunction
1/7/04	PRU propylene refrigeration compressor	primary flare		7.2			2,021.0	280.0					Malfunction
1/7/04	PRU propylene refrigeration compressor	secondary flare		7.2			2,881.0	399.0					Malfunction
12/29/03	PGC	primary flare		96.0			3,910.0	281.0	1,374.0				Maintenance
12/29/03	PGC	secondary flare		96.0					20.4				Maintenance
12/29/03	PGC	secondary flare		96.0			791.0	43.0					Maintenance
12/28/03	steam relief valve	primary flare		14.3					2,010.0	170.0	100.0		Malfunction
12/28/03	steam relief valve	secondary flare		14.3					777.0	86.0	50.0		Malfunction
12/28/03	steam relief valve	primary flare		14.3			1,467.0	213.0					Malfunction
12/28/03	steam relief valve	secondary flare		14.3			578.0	86.0					Malfunction
11/26/03	PGC	plant flare		3.4					854.0	108.0	63.0		Malfunction
11/9/03	BOP ethylene production unit	primary/secondary flare		86.0			4,120.0	342.0					Malfunction
10/19/03	BOP ethylene production unit	primary/secondary flare		816.0			13,600.0	1,900.0	615.0				Startup
8/27/03	PGC	flare		4.0			2,392.0	464.0	460.0		22.0		Malfunction
8/21/03	BOP ethylene production unit	primary/secondary flare		768.0			13,200.0	274.0	2,872.0	16.0	19.0		Shutdown
7/21/03	butadiene unit compressor	plant flare 1		5.8					1,706.0		1,618.0		Malfunction
7/21/03	butadiene unit compressor	plant flare 2		5.8					1,014.0		961.0		Malfunction
7/21/03	butadiene unit compressor	plant flare 1		5.8			579.0	80.0					Malfunction
7/21/03	butadiene unit compressor	plant flare 2		5.8			344.0	48.0					Malfunction
7/16/03	RSD-o6	RSP-o6		8.0							21.2		Maintenance
5/31/03	De-Nox steam injection	heat recovery steam generator		2.4				89.2					Malfunction

Exxon Mobil Chemical Baytown Olefins, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
5/21/03	extractive distillation tower	plant flare 1	19%	4.4				50.0	1,075.0		1,020.0		Malfunction
5/21/03	extractive distillation tower	plant flare 2		4.4			26.0	3.5	76.0		72.0		Malfunction
2/5/03	PRU compressor	base plant cold ends		1.0			1,604.0	222.0	2,161.0				Malfunction
TOTALS				2,095.2	0.0	0.0	47,615.0	4,813.7	22,080.4	380.0	3,946.2		

EXXONMOBIL CHEMICAL BAYTOWN CHEMICAL PLANT • Baytown, Harris County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compound	Butadiene	Other Emissions	Type of Event
1/11/04	valve	flare 28		1.0	8,572.0	88.0	137.0	18.0	2.0			COS: 6	Malfunction
12/5/03	compressor	flare stack 23		24.0			111.0	15.5	162.0				Malfunction
12/5/03	compressor	flare stack 24					111.0	15.3	162.0				Malfunction
12/5/03	compressor	flare stack 9					111.0	15.3	161.0				Malfunction
12/4/03	reactor	flare 9		6.1			78.0	10.8	106.0				Malfunction
12/4/03	reactor	flare stack 23					78.0	10.9	106.0				Malfunction
12/4/03	reactor	flare stack 24					79.0	10.9	107.0				Malfunction
11/18/03	heat exchanger	cooling tower 18		32.0					300.0				Malfunction
11/7/03	R 8712	flare stack 23,24,9		8.5			505.0	70.0	720.0				Malfunction
11/1/03	D-4122	flare stack 23		1.8			122.0	16.9	177.0				Malfunction
11/1/03	D-4122	flare stack 24					122.0	16.9	177.0				Malfunction
11/1/03	D-4122	flare stack 9					122.0	16.9	177.0				Malfunction
10/14/03	safety valve	flare stake 23		22.8			411.0	57.0	606.0				Malfunction
10/10/03	compressor	Flare 24,23, 9		120.8			213.0	30.0	359.0				Malfunction
9/14/03	flare	flare stack 28		0.4	2,918.7	29.9	41.0	5.4	0.4			HCN: .13; COS: 2.1; CH ₃ OH: .02	Malfunction
9/12/03	atmospheric safety valve	vent stack 17							238.0				Malfunction
9/11/03	valve	flare 23		65.0			357.0	49.0	691.0		4.0	organics: 308	Malfunction
9/11/03	equipment	flare stack 24		28.0			81.0	11.0	238.9		1.2		Malfunction
9/11/03	equipment	flare stack 9					81.0	11.0	238.9		1.2		Malfunction
9/11/03	equipment	flare 23					81.0	11.0	238.9		1.2		Malfunction
8/26/03	propylene storage drum	flare stack 24		0.4			244.0	34.0	355.0				Malfunction
8/20/03	compressor 65145	flare stack 23/24		5.1			470.0	65.0	684.0				Malfunction
8/18/03	polymers unit shutdown	flare 12		1,376.0			121.0	24.0	1,139.0				Maintenance
8/18/03	polymers unit shutdown	flare 23					225.0	31.0	326.0			HCl: 3926	Malfunction
8/18/03	polymers unit shutdown	flare 24					225.0	31.0	326.0			CH ₃ Cl: 111;	Malfunction
8/18/03	polymers unit shutdown	flare 9					225.0	31.0	326.0				Malfunction
8/11/03	conversion unit	flare 28		0.3	1,413.7	41.3	22.8	9.0	0.6			COS: 2.9; HCN: .2	Malfunction
8/8/03	R 8712	flare stack 23/24		12.0			585.0	81.0	855.0				Malfunction

ExxonMobil Chemical Baytown Chemical Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compound	Butadiene	Other Emissions	Type of Event
7/28/03	undersized pump	flare stack 12		12.0			20.7	4.1	312.0				Malfunction
7/28/03	pipe	Plant		2.3					18.0			CH ₂ Cl: 312	Malfunction
7/28/03	pipe	N/A							18.0			CH ₃ Cl: 312	Malfunction
7/27/03	rotary feeder	flare stack 24		18.0			147.9	20.5	215.0				Malfunction
7/15/03	safety valve	R6102 Vent							675.0				Malfunction
7/8/03	tower T520	flare stack 12		1.0			3.0	1.0	13.0			HCN: 416; CH ₃ Cl: 12	Malfunction
7/6/03	flange	butylpolymer		2.0			0.3	0.1	500.0				Malfunction
6/11/03	safety valve	chiller C-8710		14.0								freon 22: 400	Malfunction
6/4/03	SGU	SGU		3.0	25,679.0	263.0	329.0	43.0	3.0			hydrogen cyanide: 1.4	Malfunction
5/19/03	BHU	BHU		2.0					11.3	8		COS:18; HCN:1.4; CH ₃ OH: .3	Malfunction
5/8/03	high pressure separator plug	flare stack 24		0.7			168.9	23.4	246.0				Malfunction
5/8/03	air product	flare		3.0	2,510.7	25.7	1,461.6	38.1				COS: 1.8	Malfunction
4/28/03	heat exchanger	cooling tower 70		33.0					825.0				Malfunction
4/23/03	safety valve	BPB		37.9			348.8	48.3	475.9				Malfunction
4/23/03	safety valve	flare stack 23					348.8	48.3	475.9				Malfunction
2/21/03	polypropylene line IV	Flare		6.0			22.8	3.2	30.8				Startup
2/21/03	polypropylene line IV	Flare					110.3	15.3	150.0				Startup
2/10/03	Line IV	Flare		23.0			78.7	10.9	106.5				Shutdown
2/1/03	polypropylene line IV	Flare		8.0			204.5	28.3	278.0				Shutdown
TOTALS				1,869.8	41,094.1	447.9	8,204.1	982.3	13,333.1	8.2	7.6		

EXXONMOBIL OIL CORPORATION BEAUMONT REFINERY • Beaumont, Jefferson County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/21/04	PTR-4 Reformer Heater	LP Flare		1.3	6,111.0	66.3	477.5	66.1	114.0				Malfunction
1/12/04	PtR-3 Offgas Compressor	HP Flare		2.1	2,676.0	29.0	666.0	131.0	180.0				Malfunction
12/31/03	FCC Wet Gas Compressor	FCC Flare		3.6	1,667.0	18.2	117.5	16.3	287.5				Malfunction
12/22/03	FCC	FCC Flare		3.5	757.0	8.5	53.0						Malfunction
12/22/03	FCC	FCC Flares		3.8	17,812.1	193.3	1,220.0	161.1					Startup
12/10/03	Hot Blowdown drum	High Pressure Flare		0.7	941.0								Malfunction
12/10/03	Hot Blowdown drum	High Pressure Flare		1.3	941.0	10.2	31.4	6.2	12.7				Malfunction
12/7/03	24	Flare 10		2.7				14.4					Malfunction
11/17/03	C-307 Recip H2 Compressor	HP Flare		0.5	765.0			29.0					Malfunction
11/11/03	FCC	FCC Flare		3.9	6,467.0	67.0	533.0	74.0					Malfunction
10/8/03	No. 2 Debut Tower	No. 2 Debutanizer RV		2.9				89.6	327,540.9				Malfunction
10/8/03	#2 DeEthanizer	#7 Flare		10.5				216.4					Malfunction
10/8/03	FCC	FCC Flare		0.1	646.0								Human Error
10/7/03	CUB, HDC, PtR-3, and Coker	HP, LP, EPN		13.6	34,909.0	379.0	3,081.0	514.0					Power Outage
9/28/03	Hydrocracker	HP Flare		24.0			5,495.4						Malfunction
9/28/03	Hydrocracker	HP Flare		79.5				2,423.9					Malfunction
9/23/03	Mole Seal valve	Flare		2.4		1,113.4							Malfunction
9/13/03	FCCU	FCC Flare		12.0	11,922.0	129.0			835.0				Startup
9/10/03	PTR-3	High Pressure Flare		6.5	2,589.0		5,603.0	1,100.0					Malfunction
9/9/03	Reactor	FCC Flare		0.5	4,391.0				577.0				Shutdown
9/4/03	C-364	CHD-1 Flare		1.5	3,901.0			16.4					Malfunction
9/2/03	FCC	FCC Reactor Plenum		172.8		1,012.4			14,343.8				Malfunction
7/28/03	CO Boiler	CO Boiler Stack	99%	23.7			678,000.0					6076- Ammonia	Malfunction
6/29/03	Flare Gas Recovery Compressor	FCC Flare		Unknown	21,000.0	221.0		100.0					Startup
6/17/03	PTR-4	LP Flare		2.0	2,733.0								Malfunction

Exxonmobil Oil Corporation Beaumont Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/16/03	Flare Gas Recovery Compressor	Low Pressure Flare		77.0	59,885.0	663.0		270.0					Maintenance
6/15/03	Flare Gas Recovery Compressor	Gas Compressor Plant 3		7.0	2,178.0	24.0		90.0					Shutdown
6/1/03	E-5 exchanger	CHD-1 Flare		0.5	651.1								Malfunction
5/12/03	De C3	#10 Flare		3.6	563.0			49.3					Malfunction
4/30/03	North Fuel Gas Drum	FCC and High Pressure Flares		0.7	5,185.0			138.6					Malfunction
4/23/03	South Treat Gas Compressor	Low Pressure Flare		3.9				123.0					Malfunction
4/3/03	Cold box	HP & LP Flare		2.2				31.8					Startup
3/18/03	PTR-3	FGRU		6.0	33,368.0			536.9					Malfunction
3/7/03	Debutanizer	FCC Debut Tower		43.3				133.6					Maintenance
3/4/03	5 West Stripper Water Draw Pot	Tank 2203		1.1					552.0				Malfunction
3/2/03	FC-018	FCC Flare		0.3	588.0			12.0					Malfunction
2/28/03	Compressor	FGRC		0.5	5,234.0								Malfunction
2/26/03	Crude Unit B	Low Pressure Compressor		0.3	902.0								Malfunction
2/20/03	Wet Gas Compressor	Coker		0.9	4,470.0			23.5					Shutdown
2/17/03	Tank 594 Benzene Recovery Unit Feed Tank	Tank 594		4.5					157.0	16.0			Malfunction
2/17/03	Reformer	LP Flare		3.6	3,306.0			115.0					Startup
2/16/03	PTR-4 Reformer heater	LP Flare		27.6	9,562.0			361.0					Malfunction
2/14/03	High Suction drum	FGRC		13.9				9.6					Malfunction
2/8/03	Hydrotreater Reactor	Hydrotreater Reactor		Unknown					1,723.0		19.0		Maintenance
2/3/03	De C3	Depropanizer PSV #G 6107		0.2	727.0								Malfunction
Unknown		LP Flare		0.0	986.0	10.7	60.0	8.3	200.0				Malfunction
Unknown		HP Flare		0.0	13.2	0.1	7.2	2.0	17.7				Malfunction
TOTALS				572.2	247,846.4	3,945.1	695,345.1	6,862.9	346,540.6	16.0	19.0		

FLINT HILLS RESOURCES CORPUS CHRISTI WEST PLANT • Corpus Christi, Nueces County TX
Emissions Data (lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
12/20/03	Amine Separator	Stage Flare		12	16,395.1	178.2	144.6	17.7	96.1				Malfunction
12/20/03	Amine Separator	SRU Incinerator		0	2,341.5								Malfunction
12/17/03	West FCCU	FCCU Bypass Stack	10	37	1,546.0		126,441.0	447.2					Startup
12/16/03	West FCCU	West FCCU Bypass Stack		4			126,441.0						Malfunction
12/5/03	West FCCU	1st Stage Flare	8	15	317.4		182.5	7.0		0.8			Shutdown
11/29/03	West FCCU	1st Stage Flare	45	18	639.7		475.8	238.3					Malfunction
11/29/03	West FCCU	FCCU Bypass Stack	45	0	2,107.0		5,249.0	679.1	5,945.0				Malfunction
11/29/03	SRU #1	#1 SRU Tail Gas Incinerator		10	1,765.9	4.4							Malfunction
11/6/03	Tank 11FB405	Tank 11FB405		8					403.2			xylene, methypentane	Malfunction
10/7/03	Mid Plant Utilities (power loss)	1st Stage Flare	15	0									Malfunction
9/29/03	External Floating Roof Tank o8FB11oR	Drain Hose Hole		56					666.8	149.8		xylene	Malfunction
9/11/03	Udex Piping	Piping leak		5					1,590.0	82.8			Malfunction
8/30/03	Coker Unit	1st Stage Flare		4	1,612.6			79.9					Malfunction
8/29/03	Coker VRU	1st Stage Flare		6	382.7			87.0					Maintenance
8/28/03	Coker Unit	1st Stage Flare		9	245.4	2,746.9	143.8	37.9	27,477.8	128.0			Malfunction
8/28/03	Coker Unit	2nd Stage Flare		5	1,386.6	15.1	804.0	111.3	977.1	2.0			Malfunction
8/1/03	Alkylation Unit	1st Stage Flare		2	1,665.0	18.1	634.4	12.0					Malfunction
7/18/03	#1 SRU	#1 SRU Incinerator		17	1,339.5	4.5							Shutdown
7/17/03	#1 SRU	#1 SRU Incinerator		17	1,339.5								Startup
7/15/03	#SRP	#1 SRU Incinerator		85	5,872.0								Malfunction
5/15/03	SRU #1	#1 Tail Gas Incinerator		4	846.6								Malfunction
3/10/03	#2 SRU	#2 SRU Incinerator		336	20,000.0								Startup
2/28/03	#2 SRU	#2 SRU Incinerator		192	25,000.0								Shutdown
TOTALS				840	84,802.5	2,967.2	260,516.1	1,717.4	37,156.1	363.5	0.0		

FLINT HILLS RESOURCES EAST REFINERY • Corpus Christi, Nueces County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/25/04	East FCCU II	Main plant flare		39.0			95.0	19.0	1.0	1.0			startup
1/15/04	East FCCU II	Main plant flare		128.7	145.0		1,136.0	68.0	203.0	3.0	3.0		maintenance
12/27/03	East FCCU II	Main plant flare		2.7			536.0	98.0					startup
12/27/03	East FCCU II	FCCU II scrubber		76.7	82.0		546.0	2,919.0					startup
12/12/03	E. FCCU II	Main plant flare		34.5	954.0		3,744.0	296.0	8.0		8.0		malfunction
11/14/03	East FCCU II	Main plant flare		66.8			2,751.0	444.0	8.0		8.0		startup
11/12/03	East FCCU II	FCCU II scrubber		127.0	411.0		1,967.0	2,580.0					startup
11/5/03	East #1 SRU	SRU #1 tail gas incinerator		28.0	7,248.0								startup
10/17/03	East No 1 SRP	SRU #1 tail gas incinerator		145.0	15,455.0								maintenance
10/16/03	East No 1 SRP	Main plant flare		144.0	928.0		5.0	1.0					maintenance
10/6/03	East FCCU II	Main plant flare		102.0	569.1			377.1	10.7		10.7		maintenance
9/12/03	East No 1 SRP	ESRU tail gas incinerator		17.0	1,192.4								malfunction
9/3/03	SRP claus unit thermal reactor	Acid gas flare		0.4	1,059.0			0.3					malfunction
9/3/03	E. #2 SRP claus unit thermal reactor	TGI incinerator		16.4	163.4								malfunction
8/31/03	SRU #2	TGI incinerator		96.0	2,227.8								maintenance
7/6/03	DIH Overhead Cooler	DIH fugitives		6.1					2,369.6	0.6		hexane, pentane	malfunction
7/4/03	tank E18T1400	Tank E18T1401		4.0					1,200.0				maintenance
7/1/03	Amine Regeneration Unit (ARU)	Main flare		5.9	5,280.5			1.4					malfunction
7/1/03	ARU	ESRU tail gas incinerator		13.0	779.4								malfunction
TOTALS				1,053.1	36,494.6	0.0	10,780.0	6,803.8	3,800.3	4.6	29.7		

GOLDSMITH GAS PLANT • Goldsmith, Ector County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/30/04	compressor engine	upset vent		3.7		581.1			10,603.2			Nitrogen (N) 729.11	Malfunction
1/20/04	A turbine	50# flare		5.5	23,773.6	258.1	6,112.8	1,534.9	3,339.5			N:16957	Maintenance
1/20/04	B turbine	50# flare		1.8	7,924.5	86.0	2,037.6	511.6	1,113.2			N:5652.3	Maintenance
1/13/04	compressor engine	upset vent		3.7		581.1			10,603.2			N:729.11	Malfunction
11/26/03	A turbine	50# flare		2.0	6,778	73.6	1,741.1	437.2	1,104.8			N:4512.31	Malfunction
11/22/03	sulfur boiler	acid gas flare		3.8	43,576	473.1	99.6	25.0	9.18			N:17.74	Malfunction
11/18/03	compressor	upset vent		1.3		372.4			13,588.7			N:467.2	Malfunction
11/18/03	compressor	upset vent		1.2		372.4			13,458.3			N:487.2	Malfunction
11/18/03	compressor	upset vent		1.2		372.4			13,828.4			N:467.2	Malfunction
11/17/03	A turbine	50# flare		4.8	20,830	226.2	5,350.7	1,343.5	3,395.2			N:13867.3	Malfunction
10/31/03	compressor engine	upset vent		5.3		404.5			7,379.7			N:507.45	Malfunction
10/28/03	A turbine	50# flare		2.3	8,460	91.9	2,173.1	545.6	1,378.9			N:5631.97	Malfunction
10/27/03	CPU	sweet flare		0.7				161.3	355.7			N:1602.61	Malfunction
10/25/03	SRU	acid gas flare		1.2	13,345	144.9	32.6	8.2	5.4			N:9.68	Malfunction
10/22/03	compressor engine	upset vent		14.8		3,711.3			67,716.5			N:4656.44	Malfunction
10/21/03	A turbine	50# flare		1.6	5,415	58.8	1,390.9	349.3	774.1			N:3604.86	Malfunction
10/20/03	A turbine	50# flare		2.3	6,441	69.9	1,654.5	415.4	1,049.8			N:4287.93	Malfunction
10/19/03	coupling	50# flare		2.2	5,962	64.7	1,531.4	384.5	1,012.3			N:3968.89	Malfunction
10/14/03	B turbine	50# flare		70.0	7,847.5	85.2	1,952.0	490.1	2,318.1			N:5055.2	Maintenance
10/13/03	gas compressor	upset vent		1.1		251.3			9,169.3			N:315.26	Malfunction
10/10/03	compresor	upset vent		4.7		486.0			17,733.6			N:609.71	Malfunction
10/5/03	A turbine	50# flare		8.2	12,983.4	141.0	3,229.5	1,958.2	1,917.6			N:8363.6	Malfunction
10/4/03	SRU	acid gas flare		0.3	10,401	112.9	42.2	10.6	7.6			N:1.4	Malfunction
9/26/03	compressor engine	#5 compressor		12.0		539.8			9,139.9			N:677.31	Malfunction
9/25/03	pipeline	acid gas flare		3.1	10,597	115.1	25.9	6.5	4.3			N:7.69	Malfunction
9/25/03	pipeline	turbine flare		3.4	14,957	162.4	3,720.4	934.2	2,209.1			N:9634.98	Malfunction
9/15/03	compressor engine	upset vent		2.7		338.4			6,174.0			N:424.6	Malfunction
9/14/03	compressor engine	upset vent		40.1		7,968.7			145,394.9			N:9997.9	Malfunction

Goldsmith Gas Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/13/03	A/B turbine	turbine flare		54.0	54,178	588.2	13,476.3	3,383.8	8,002.0			N:34900.1	Malfunction
9/12/03	compressor engine	upset vent		3.5		381.4			6,959.6			N:478.57	Malfunction
9/10/03	compressor engine	upset vent		2.2		826.8			14,931.0			N:1185.1	Malfunction
8/31/03	turbine combustor	turbine flare		215.8	55,011	597.2	13,683.4	3,435.8	8,125.0			N:35436.6	Malfunction
8/27/03	compressor engine	upset vent		7.5		1,294.9			23,626.1			N:1624.62	Malfunction
8/17/03	SRU	acid gas flare		161.8	2,515,903.8	27,315.4	6,146.7	1,543.4	1,012.3			N:1825.21	Maintenance
8/11/03	A turbine	turbine flare		1.8	4,458	48.4	1,108.8	278.4	658.4			N:2871.5	Malfunction
8/11/03	compressor engine	upset vent		6.1		940.5			17,159.5			N:1179.95	Malfunction
8/9/03	engine	upset vent		16.1		3,246.6			59,236.2			N:4073.3	Malfunction
8/5/03	compressor engine	upset vent		23.5		2,398.2			43,757.1			N:3008.9	Malfunction
7/31/03	suction header line	upset vent		25.9		2,217.5			40,460.8			N:2782.2	Malfunction
7/25/03	compressor engine	upset vent		2.1		266.9			5,598.8			N:334.9	Malfunction
7/22/03	B turbine	turbine flare		69.0	86,295	936.9	21,465.1	5,389.7	12,745.6			N:55589.2	Malfunction
7/21/03	amine circulation pump	residue compressor flare		1.5			869.5	218.3	6.2			N:4239.4	Malfunction
7/16/03	compressor engine	upset vent		1.2		312.2			5,696.5			N:391.7	Malfunction
7/10/03	SRU	acid gas flare		1.8	42,835	465.1	173.8	45.8	42.7			N:5.77	Malfunction
6/23/03	A turbine	50# flare		4.4	20,543	223.0	4,675.7	1,174.0	3,033.0			N:11347.8	Malfunction
6/15/03	fuse	acid gas flare		10.1	115,883	2,163.5	5,338.5	1,340.4	19,917.6			N:14310.2	Malfunction
6/9/03	A/B turbine	sweet flare		6.4			7,264.3	1,824.0	4,022.8			N:18122.6	Malfunction
6/9/03	A/B turbine	acid gas flare		1.9	5,041	54.7	12.3	3.1	2.0			N:3.7	Malfunction
6/5/03	A/B turbine	residue compressor flare		7.7			13,471.3	3,382.5	96.7			N:65682.6	Malfunction
6/2/03	compressor engine	upset vent		11.3		330.7			6,413.8			N:6952.2	Malfunction
5/25/03	B turbine	50# flare		2.0	6,389	69.4	1,822.2	457.5	1,176.6			N:4443.5	Malfunction
5/23/03	compressor engine	upset vent		2.5		225.8			366,835.4			N:413.96	Malfunction
5/20/03	fuel gas suction header	upset vent		0.3		876.5			17,374.7			N:1279.6	Malfunction
5/19/03	compressor engine	upset vent		10.0		1,019.7			40,425.1			N:1488.6	Maintenance

Goldsmith Gas Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
5/18/03	compressor engine	upset vent		2.6		901.2			17,592.0			N:1651.9	Malfunction
5/4/03	B turbine	turbine flare		4.9	18,134	196.9	5,171.7	1,298.6	3,339.3			N:12611.4	Malfunction
4/29/03	B turbine	turbine flare		3.7	18,620	202.2	4,661.8	1,170.6	5,778.3			N:10978.9	Malfunction
4/21/03	compressor engine	upset vent		129.5		5,372.7			1,959,237.1			N:8934.6	Maintenance
4/14/03	B turbine	turbine flare		7.9	29,557	320.9	7,400.0	1,858.1	12,340.9			N:17427.6	Malfunction
4/4/03	#5 inlet receiver	upset vent		8.4		1,185.1			49,554.8			N:1970.8	Malfunction
4/1/03	A/B turbine	50# flare		292.7	83,138.5	902.6	22,492.1	5,647.6	23,974.9			N:59836.6	Maintenance
3/17/03	compressor engine	upset vent		128.5		3,737.4			153,361.7			N:5191	Maintenance
3/8/03	compressor engine	#5 vent		53.7		2,090.0			85,472.9			N:3362.8	Malfunction
3/5/03	amine treater pump	residue compressor flare		4.3	unknown	unknown	3,832.4	962.3	82.5			N:18685.6	Malfunction
2/24/03	B turbine	turbine flare		1.1	2,014	21.9	544.9	144.2	580.8			N:1449.6	Malfunction
2/24/03	SRU	acid gas flare		0.7	5,111	55.5	12.5	3.1	4.1			N:3.71	Malfunction
TOTALS				1,493.0	3,262,401.9	79,928.9	164,717.6	42,677.5	3,363,410.2	0.0	0.0		

HUNTSMAN PETROCHEMICAL PLANT • Odessa, Ector County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/30/03	Ethylene Column System	Flare and PSV		3.8				166.4	14,424.2				Malfunction
11/9/03	1E-1301	Open Process Sewer		2.0					910.6				Malfunction
11/2/03	W-72	Crack		10.5					25.9	13.5	12.4		Malfunction
10/17/03	Olefin	Air and Steam Assit Flares		40.3	0.1		15,555.2	5,349.9	214,011.2	3,539.5	2,326.5	Vinyl Acetate: 1722.2	Malfunction
9/15/03	Axi-Loop System	Air Assist Flare		0.3				1.8	13.0				Malfunction
8/28/03	GE-70	Steam Assist Flare		5.0				218.0	32,736.2				Malfunction
7/30/03	Overhead Condenser	PSV		0.2					6,810.4				Malfunction
7/11/03	Olefin Water Stripper	Cooling Towers		57.0					320.9	192.2			Malfunction
6/16/03	Butane Storage Tank no. 17	Manway		1.3					6,305.7	3.7			Malfunction
5/25/03	Feed Fractionation, Propylene Refrigeration and the Product Treating Systems	Flare System		15.2				418.9					Malfunction
5/13/03	Process Heat Exchanger 1E-1302	LLDPE Cooling Tower		12.5					25,916.2			8984.4- Isopropyl alcohol	Malfunction
5/1/03	GE70 Propylene Refrigeration Compressor	Flare System		1.4					26,174.0				Malfunction
4/19/03	Pre-DeC1	Flare		5.8				536.9	63.1	32.8	30.3		Malfunction
3/14/03	FBM	PSV Air Assist Flare		0.5			119.7	59.9	26,246.2				Malfunction
2/26/03	LLDPE	cooling tower		78.1					3,709.8	14.8			Malfunction
2/7/03	LLDPE	Silo Vents		13.7					1,066.5				Malfunction
TOTALS				247.3	0.1	0.0	15,674.9	6,751.8	358,734.0	3,796.5	2,369.2		

HUNTSMAN PORT NECHES REFINERY • Port Neches, Jefferson County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/15/04	F6 Regenerator	F6 Regenerator Vent		2.3					411.0				Malfunction
1/15/04	Condensers	North/South Flares		1.0					38.9		25.0		Malfunction
1/11/04	PO/MTBE Facility	Perox Fugitives		4.8					15.0				Malfunction
1/3/04	Boiler No. 1	North/South Flare		9.6					93.3		7.3		Malfunction
1/1/04	Regenerator	Regenerator tower vent		4.8					468.0				Malfunction
12/21/03	Tank 109	Tank 109		48.0					8,000.0				Malfunction
12/13/03	Incinerator	Regenerator Vent		0.8					100.0				Malfunction
12/10/03	F6 Incinerator	F6 Argon/ Reabsorber/ Regenerator		1.1					304.0				Malfunction
12/10/03	Flare Line	South Flare Header		0.1					530.0		270.6		Malfunction
12/6/03	Tank TO-168	Tank TO-168		2.2					22.4				Malfunction
11/26/03	Finished Butadiene Tank	North/South Flares		0.3					11.3		11.3		Malfunction
11/26/03	Finished Butadiene Tank	Tank 12 Water Boot PRV		0.3					353.0		352.0		Malfunction
11/25/03	EO Scrubber	EO Scrubber		0.2					15.0		15.0		Malfunction
11/24/03	F6 Incinerator	F6 Temporary Flare 1		720.0	9.6		3,073.0	358.0					Maintenance
11/24/03	F6 Incinerator	F6 Temp Flare		40.0	9.6		3,073.0	358.0					Maintenance
11/22/03	F6 Unit Incinerator	Regenerator Flash Drum Vent		6.0			31,146.0		639.0				Malfunction
11/14/03	F6/G6 Facility power loss	GFS PRV		5.0					6,634.0				Malfunction
11/14/03	F6/G6 Facility power loss	OMS Vent		5.0					10,550.0				Malfunction
11/14/03	F6/G6 Facility power loss	Tank T-G6-1 A&B		5.0					1,592.0				Malfunction
11/14/03	F6/G6 Facility power loss	EO Scrubber		5.0					305.0				Malfunction
11/14/03	F6/G6 Facility power loss	Contactant Vent		5.0					763.6				Malfunction
11/10/03	F5 Emergency Fire Water Station Chlorine Cylinder	F5 Fugitives		2.0								10lbs chlorine	Malfunction

Huntsman Port Neches Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/6/03	F4 Unit Leaking Exchanger	Cooling Tower #2/#3		240.0					25,761.0				Malfunction
11/5/03	Tank 109	109 Finished Line		23.0					76.3		76.3		Malfunction
11/5/03	Tank 109	North/South Flares		23.0					53.3		53.1		Malfunction
10/30/03	South 4 Group Transfer Line	South 4 Group Transfer Line		0.3					88.0	0.0	47.0		Malfunction
10/30/03	Butadiene Charge Pump	South Flare		2.6					36.4		36.3		Malfunction
10/25/03	S2C2 Compressor System	North/South Flares		0.9					25.4		23.8		Malfunction
10/25/03	E4 Console	Relief Valve on Ammonia Absorber		0.2								2514lbs ammonia	Malfunction
10/20/03	PO/MTBE Plant - MTBE Drying Column Overhead Line	PO/MTBE Flare		64.4			316.4	43.8	266.4				Shutdown
10/14/03	S2CIA Recovery Vent Compressor	North/South Flares		0.9					52.4		13.7		Malfunction
10/5/03	Incinerator Combustion Air Blower	F6 Regenerator Vent		3.0					169.0				Malfunction
9/29/03	Flue Gas Recovery Compressor	PO/MTBE Flare		76.0			1,146.9	158.8	2,290.7				Maintenance
9/25/03	Ethylene Oxide Charge Pump	R&S Fugitives		0.0					51.4				Startup
9/24/03	PO/MTBE Unit	PO/MTBE Flare		22.9			587.4	77.0	873.2				Malfunction
9/23/03	Ammonia Cooler	Ammonia Cooler E-E7-81		0.8								129lbs ammonia	Malfunction
9/21/03	Catalyst Feed Line	PO/MTBE Flare		21.7			2,094.7	286.4	3,360.9				Malfunction
9/16/03	Overhead Condensor Line	MTBE Drying Column Overhead Line		58.0					8,631.6				Malfunction
9/6/03	Steam Meter FC610	Argon Vent		0.3					108.0				Malfunction
9/6/03	Recovery Vent Compressor S2CIA	C4 Flares		0.6					69.4		18.1		Malfunction
9/4/03	Methanol Extractor Level Indicator	PO Flare		11.1			448.7	57.9	649.3				Malfunction
9/3/03	S2CI-A Recovery Vent Compressor	North/South Flares		11.9			91.9	12.7	252.6		66.0		Malfunction

Huntsman Port Neches Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
8/26/03	Steam Boiler No. 2	North/South Flares		147.5			8,645.5	1,197.0	18,199.5		4,787.5		Malfunction
8/25/03	Tank F-P-137	F-P-137 EO Rundown		0.2					67.0				Malfunction
8/23/03	PO/MTBE Plant Transformer	Reabsorber Vent		1.6					226.0				Malfunction
8/23/03	Stress Cone - power outage	PO/MTBE Flare		137.1			9,626.6	1,332.8	21,709.3				Malfunction
8/23/03	MO/MTBE Plant	A3 High Pressure Flare		0.9			11.9	1.7	8.0				Malfunction
8/22/03	Vent Gas Compressor Relief Valve	North/South Flares		10.3			41.0	5.7	112.5		29.4		Malfunction
8/20/03	Tank 77	Tank 77		0.2					10.5		9.2		Malfunction
8/18/03	F6 incinerator Burners	F6 Incinerator		0.8					108.0				Malfunction
8/17/03	Cogen Unit	PO Flare		13.8			2,103.2	291.2	4,289.9				Malfunction
7/22/03	"B" Vent Compressor	North/South Flares		0.2					70.4		18.4		Malfunction
7/11/03	N501 Filter	North Flare		0.5			18.6	2.6	52.4				Malfunction
7/7/03	F-E7-54 Ammonia Removal Tower Leak	F-E7-54 Ammonia		0.3								8lbs ammonia	Malfunction
7/7/03	G6 3rd Leak	G6 Fugitive		28.0					40.0				Malfunction
7/6/03	Cycle Water Tank Leak	G6 Unit Fugitives		28.0					801.2				Malfunction
6/29/03	S2CI-A Recovery Vent System Compressor	North Flare		0.3					56.5		14.8		Malfunction
6/14/03	Pot F F6 112 Water Seal	Vent from F F6 112		0.3					194.0			3 lbs. vinyl chloride	Malfunction
6/13/03	S2CI-C	North/South Flares		2.0			75.3	10.4	207.0		54.1		Malfunction
6/12/03	A3 Unit RPG Process	UERO37 High Pressure Flare		201.1			160.3	22.2	108.6				Shutdown
6/8/03	C-FS-008 Compressor	PO Flare		8.8					181.6				Malfunction
6/7/03	Epox Unit Compressor	PO Flare		1.6					199.7				Malfunction
6/5/03	F6 Incinerator	F6 Temporary Flare 1	15%	144.0									Maintenance

Huntsman Port Neches Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/5/03	F6 Incinerator	F6 Temp Flare 2	15%	144.2									Maintenance
6/4/03	N5DI Butadiene Wash Water Tower	North/South Flares		27.6					200.5		200.0		Malfunction
6/2/03	MTBE Storage Tanks	Temporary Thermal Oxidizer		537.0			1,515.5	209.8	9,985.0				Maintenance
5/27/03	Exchanger E-F5-002	PO Flare		9.8			209.6	29.0	590.9				Maintenance
5/15/03	Pressure Controller PC-0805	North/South Flares		12.0			36.2	5.0	77.1		20.7		Malfunction
5/15/03	Propylene Recovery Column Overhead Consensor	PO/MTBE Flare		154.4			363.7	45.6	437.6				Malfunction
5/13/03	Recovery Vent Compressor System	North/South Flares		0.2			3.3	0.5	9.1		2.4		Malfunction
5/13/03	Substation air conditioner	PO/MTBE Flare		5.0			134.1	16.6	188.9				Malfunction
5/12/03	F4 Unit	F4 Fugitives		9.0					136.2				Shutdown
5/12/03	F4 Unit	F4 Waste Water Fugitives		12.0					47.9				Shutdown
4/28/03	Unknown	North/South Flares		10.0			100.6	13.9	276.4		72.2		Malfunction
4/11/03	Propylene Recovery Tower Overhead Consenser	PO/MTBE Flare		19.6			464.7	62.6	618.7				Malfunction
4/10/03	Absorber E-E4-74	E-E4-7B Flange		3.0								21lbs ammonia	Malfunction
4/6/03	Ammonia Pump	P-E7-100B		0.7								50lbs ammonia	Malfunction
4/6/03	S4D16C Reactor	North/South Flares		93.8			638.8	88.4	86.0	0.1	0.6		Malfunction
4/3/03	Cooling Tower	Cooling Tower		1,320.3					257,578.0				Malfunction
3/30/03	Tank 77 Hatch	Fugitive		33.2					15,736.3	558.2	888.2	10632.29 vinyl chlorohexane	Malfunction
3/25/03	Vent Compressor Accumulator Pressure Transmitter	North/South Flares		1.8			61.1	8.5	130.2		35.0		Malfunction
3/23/03	Refinery Grade Propylene Section	High Pressure Flare		67.0			635.0	87.9	430.4				Startup
3/19/03	Butane & Butylene Feed Line	North/South Flares		1.6			75.8	10.5	206.9		0.3		Malfunction

Huntsman Port Neches Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
3/16/03	UPS Switch	North/South Flares		7.8			45.5	6.3	105.1		32.7		Malfunction
3/15/03	UPS Switch	North/South Flares		9.0			596.1	82.5	1,375.2		428.1		Malfunction
3/15/03	UPS Switch	Tank 77 Hatch		0.3					515.0	18.3	29.1		Malfunction
3/13/03	Regenerator Vent	Regenerator Vent		0.9					199.0			4lbs vinyl chloride	Malfunction
3/10/03	MTBE T & I	South Flare Header		339.0					2,353.0		1,141.0		Maintenance
3/2/03	FC1034 Combustion Air Flow	Reabsorber Vent		3.0			8,235.0		196.0		15.4		Malfunction
2/22/03	Tank TO-137	Tank TO-137		60.0					384.0				Malfunction
2/21/03	PRV-6RV-516	Butadiene Unit		0.3					11.3		6.2		Maintenance
2/20/03	Product Recovery Compressor	Butadiene Unit		0.3			21.4	3.0	58.8				Malfunction
2/17/03	Combustion Air Blower	Regenerator Vent		0.8					243.0			4lbs vinyl chloride	Malfunction
2/15/03	MTBE unit Groundbed & Water Knockout Vessel Leak	W3D4 Guardbed & Water KO Vesel		0.6					345.5		0.7		Malfunction
2/12/03	Compressor Suction Line Bleeder Valve	Butadiene Unit		24.0					1,963.9		429.7		Malfunction
2/3/03	N 5DI Tower	C4 Plant		0.1			19.6	2.7	55.5		55.3		Malfunction
1/7/03	PO/MTBE Unit	PO Flare		360.0			16,220.0	2,245.8	37,476.0				Maintenance
TOTALS				5,424.9	19.2	0.0	92,036.3	7,134.7	452,320.2	576.6	9,286.3		

MOTIVA PORT ARTHUR REFINERY • Port Arthur, Jefferson County
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/9/04	SHU Charge Pump	Alky Emergency Flare		0.5				168	910				Malfunction
1/9/04	Alkylation	FCCU Emergency Flare		0.0			551	186	1,756		1		Malfunction
1/9/04	Alkylation	Alky Emergency Flare		0.5			551	186	1,756		1		Malfunction
12/20/03	DCU	Process Fugitives		77.0				6,443					Maintenance
12/6/03	VPS4	VPS Emergency Flare		5.3	2,951	33	57	8	86			7.5- Hydrogen	Malfunction
10/27/03	FCCU	FCCU Flare		0.2	5,266	57	722	100	1,175				Malfunction
10/27/03	HCU	HCU Emergency Flare		0.3	1,162	13	79	15	11				Malfunction
10/15/03	SRU 2,3,4	ARU Emergency Flare		0.9	7,819	42	1	0					Malfunction
10/15/03	SRU 2,3,4	DCU Emergency Flare		0.0	7,819	42	1	0					Malfunction
10/14/03	TGTU2	TGTU2 Incinerator	30	24.0	15	1	1	0					Malfunction
10/14/03	VPS4	VPS4 Emergency Flare	30	0.0	6	0	69	10	127			0.08- Hydrogen	Malfunction
10/14/03	DCU	DCU Emergency Flare	30	0.0	24,012	260	256	50	3,278				Malfunction
10/14/03	HTU4	HTU4 Emergency Flare	30	0.0	74	1	65	13	0				Malfunction
10/14/03	CRU4	CRU Emergency Flare	30	0.0			729	147	856			Hydrogen: 224.2	Malfunction
10/14/03	HCU	HCU Emergency Flare	30	0.0	2,751	30	210	41	44				Malfunction
10/14/03	FCCU1&2	Emergency Flares	30	0.0	7,465	81	1,474	203	4,026		2		Malfunction
10/14/03	FCCU3	CO Boiler/ Scrubber Stk & Bypass	0 over/ 30	0.6									Malfunction
9/25/03	FCCU3	Emergency Flare		24.0	80	1	50	7	87				Startup
9/22/03	FCCU3	Emergency Flare		120.0	6	0	787	109	188		0		Shutdown
9/15/03	FCCU	Alky Emerg Flare		22.3	1,030	11	423	17	1,070				Malfunction
9/15/03	HCU	HCU Emergency Flare		1.0	2,063	22	194	38	73				Malfunction
9/15/03	FCCU	FCCU3 Emergency Flare		22.5	1,030	11	423	59	1,070				Malfunction

Motiva Port Arthur Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
9/13/03	Tank 1475	PH 27 Process Fugitives		12.0					123,603				Malfunction
9/12/03	HCU	HCU-HTU1-HTU2 Flare		0.1	1,293	14	117	23	46				Malfunction
9/9/03	4VPS	Flare		296.1	3,787	43	75	10	113				Maintenance
7/23/03	H ₂ S Absorber	FCCU ₃ Emergency Flare		0.6			110	16	296				Malfunction
6/23/03	Booster Blower Aftercooler	TGTU ₁		24.5	1,376								Malfunction
6/20/03	No. 2 Debutanizer Tower	3FCCU Process Fugitives		0.0					495		2		Malfunction
6/20/03	A-3 drum	FCCU ₃ Emergency Flare		0.4	8		138	19	217				Malfunction
6/20/03	A-3 drum	Alky Emergency Flare		0.0	8		138	19	218				Malfunction
6/13/03	HCU	HCU Emergency Flare		7.0	2,339	25	239	47	57				Malfunction
4/29/03	ASTU	N. API Separator		24.0					7,506	15			Maintenance
4/25/03	LOU	Boiler		23.5				4,280					Malfunction
4/19/03	Combustion Air Blower & FCCU ₃	Alky Emergency Flare		5.0	413	4	163	22	445		1		Malfunction & Startup
4/19/03	FCCU ₃	FCCU Emergency Flare		5.0	413	4	163	22	445		1		Malfunction & Startup
4/19/03	3FCCU	Process Fugitives		5.0		7			2,309		8		Malfunction
4/19/03	FCCU ₃	Fixed Site Inland		2.0				28	10		10		Malfunction
4/15/03	Wet Gas Compressor	FCCU Process Fugitives		3.9		27			1,963		2		Malfunction
4/15/03	Wet Gas Compressor	Alky Emergency Flare		0.0	805	9	140	19	345		1		Malfunction
4/15/03	Wet Gas Compressor	FCCU ₃ Emergency Flare		0.0	805		140	19	255		1		Malfunction
4/15/03	FCCU ₃	By-Pass Stack		2.0								17800- PM	Startup
4/14/03	Power Station No. 2	TGTU No. 2 Incinerator	15	8.4	189		1	10					Malfunction
4/14/03	Power Station No. 2	TGTU No. 1 Incinerator	15	18.5	189		1	10					Malfunction
4/14/03	Alky	Emergency Flare		24.0	1,248	14	302	53	113				Malfunction
4/14/03	FCCU ₃	Emergency Flare		24.0	1,248	14		53	113				Malfunction
4/14/03	FCCU ₃	Process Fugitives		0.3		1,829	713		232,950		424		Malfunction

Motiva Port Arthur Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
4/14/03	VPS4	Emergency Flare	15	3.3	255	3	192	27	537			o.6- Hydrogen	Malfunction
4/14/03	CRU4	Emergency Flare	15	1.3	290	3		5					Malfunction
4/14/03	HTU	Emergency Flare		13.7	4,290	47	535	62	215			168- Hydrogen	Malfunction
4/14/03	DCU	Emergency Flare		4.3	5,218	35	203	89	418				Malfunction
4/14/03	Fixed Site Inland			0.7								?	Shutdown
4/7/03	HCU	HTU Emergency Flare		0.5	2,042	22	170	33	37				Malfunction
2/13/03	CO Boiler	FCCU	45	6.5									Shutdown
2/10/03	Hydrogen Sulfide Stripper Tower	FCCU ₃ Flare		0.6	343	3	19	2	53				Malfunction
2/9/03	Vacuum Pipe Still No. 4	HCU Emergency Flare		8.0	1,735	24	179	24	685				Malfunction
2/8/03	Vacuum Pipe Still No. 4	HCU ₁		13.2	2,950	32	305	42	898				Malfunction
2/4/03	CDHDS tower	FCCU ₃ Flare Stack & Alky 4		0.1	842								Malfunction
2/4/03	FCCU	Plant Fuel Gas		19.5	1,665								Malfunction
1/31/03	FCCU ₃	Power Stack		20.0	570								Malfunction
TOTALS				876.7	97,871	2,764	10,688	12,735	390,852	15	453		

PHILLIPS 66 REFINERY • Borger, Hutchinson County TX
Emissions Data (Lbs./Event): 1.31.03 - 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/30/04	Flare	Refinery West HC Flare, 66FL2	100%	5.8	8.0	0.1	5.0	1.0	5.5	0.2			Maintenance
1/17/04	Reactor Product Condensor	#4 Refinery Cooling Tower, F-54-C8		8.0					20,287.0	654.3			Malfunction
1/12/04	Unit 19.3 Distillate HDS	U19.3 Charge & Fractioner Furnace, 19B2/19H4		60.0	5.0		434.0						Maintenance
1/10/04	Unit 19.3 Distillate HDS	Refinery East HC Flare, 66FL1		46.0	508.0	6.0		1.4	29.0				Maintenance
1/8/04	Unit 40 CO Boiler Tube Leak	U40 CO Boiler, 85B2	60%	0.5									Maintenance
12/12/03	Unit 44 Amine Still Air Fins	ARDS Emergency Sulfur Flare, 66FL13		0.4	3,780.0	41.0		1.1					Malfunction
12/11/03	Unit 40 CO Boiler	Unit 40 CO Boiler, 85B1	34%	0.0									Maintenance
12/9/03	Unit 41 Reformer Furnace	SCOT Unit Incinerator, 43I1		48.3	78,473.0	43.0							Malfunction
12/5/03	Unit 41 Reformer Furnace	ARDS Emergency Sulfur Flare, 66FL13		14.9	1,301.0	14.0		465.0					Malfunction
12/5/03	Unit 41 Reformer Furnace	H ₂ S Emergency Flare, 66FL6		0.0	1,172.0	12.0		0.0					Malfunction
12/5/03	Unit 41 Reformer Furnace	SCOT Unit Incinerator, 43I1		0.0	9,162.0	5.0							Malfunction
12/5/03	Unit 41 Reformer Furnace	SRU Incinerator, 34I1		0.0	62.0	0.7							Malfunction
11/25/03	Unit 43 "A" Train	Unit 43 Incinerator, 43I1		19.8	693.0	8.0							Malfunction
11/23/03	Unit 42 Amine Contractor	ARDS Emergency Sulfur Flare, 66FL13		13.0	1,350.0	13.8						3.6lbs ammonia	Malfunction
11/23/03	Unit 42 Amine Contractor	SCOT Unit Incinerator, 43I1		0.0	9,056.0	98.0							Malfunction
11/18/03	Unit 29 CO boiler	U29 CO Boiler Stack, 85B1	63%	0.3									Maintenance
11/13/03	Y1 Precipitator	NGL Corrosive Flare, 66FL5	100%	0.5	0.1		102.0	20.0	151.1	2.6			Malfunction
11/10/03	Unit 43 "A" Claus Train	SCOT Unit Incinerator, 43I1		2.7	2,459.0	28.0							Malfunction

Phillips 66 Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/6/03	Unit 34 Tail Gas Treat Unit	H ₂ S Emergency Flare, 66FL6		4.0	2,024.0	20.7		0.0					Malfunction
11/6/03	Unit 34 Tail Gas Treat Unit	SRU Incinerator, 34I1		4.9	314.0	3.4							Malfunction
10/30/03	North Off Gas Compressor	ARDS HC Flare, 66FL12		4.0	2,120.0	23.0		3.0					Maintenance
10/20/03	Unit 43 SRU	SCOT Unit Incinerator, 43I1		60.0	2,359.0	26.0							Startup
10/14/03	Unit 29 Main Air Blower	Refinery CAT Flare, 66FL3		6.1	107.0	1.0	41.0	8.0	98.0				Malfunction
10/14/03	Unit 29 Main Air Blower	U29 CO Boiler Stack, 85B1	55%	5.9			83,838.0					356lbs ammonia	Malfunction
10/3/03	Unit 20 CO Boiler	U29 CO Boiler Stack, 85B1	65%	0.7									Maintenance
10/2/03	Unit 44	ARDS Emergency Sulfur Flare, 66FL13		648.0	65,348.0	710.0	479.0	45,620.0				174lbs ammonia	Shutdown
10/2/03	Unit 43 SRU	SCOT Unit Incinerator, 43I1		72.0	1,683.0	18.0							Shutdown
9/26/03	Unit 45	ARDS HC Flare, 66FL12		132.0	3,000.0	35.0						Methyl mercaptan	Shutdown
9/26/03	Unit 45	SCOT Unit Incinerator, 43I1		0.0	18.0	0.2							Shutdown
9/24/03	Air Conditioner Failure	U29 CO Boiler Stack, 85B1	60%	9.1			24,000.0					525lbs ammonia	Malfunction
9/24/03	Air Conditioner Failure	Refinery CAT Flare, 66FL3		9.5	2,300.0	25.0	875.0	171.0	2,075.0			525lbs ammonia	Malfunction
9/24/03	Air Conditioner Failure	U29 CO Boiler Stack, 85B1	60%	8.0			24,000.0					525lbs ammonia	Malfunction
9/17/03	Low Pressure Cold Light Fractionator Feed Exchanger	ARDS HC Flare, 66FL12		15.0			859.0	168.0					Malfunction
9/5/03	Unit 34 SRU & TGTU	SRU Incinerator, 34I1		18.1	61.0	0.7							Startup
8/29/03	Unit 29 CO Boiler Stack	U29 CO Boiler Stack, 85B1	100%	1.0									Maintenance
8/29/03	Unit 34 SRU & TGTU	SRU Incinerator, 34I1		155.6	968.0	10.5							Shutdown
8/9/03	Acid Gas Compressor	NGL Non-Corrosive Flare		1.7	1,242.0	12.7		0.2					Malfunction
8/9/03	Unit 34 SRU & TGTU	SRU Incinerator, 34I1		1.7	40.0	0.4							Malfunction

Phillips 66 Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
8/8/03	ARDS Derrick Flare Signal Pressure Gauge	ARDS Emergency Sulfur Flare, 66FL13	100%	3.0	2,118.0	22.8		0.5					Maintenance
7/24/03	Column 43	NGL Non-Corrosive Flare, 66FL4	100%	6.3			1,000.0	139.0	3,958.9	22.4			Malfunction
7/22/03	Unit 11	NGL Non-Corrosive Flare, 66FL4		2.0	58.5		190.0	26.3	687.6	4.3			Shutdown
7/20/03	Column 19 Accumulator	NGL Non-Corrosive Flare, 66FL4	100%	0.3	0.1		38.0	5.0	323.3	0.9			Malfunction
7/5/03	Tank R29	Unit 2 Fugitive, F-2		0.6					566.0			Toluene	Malfunction
7/4/03	Unit 34A Sulfur Train	ARDS Emergency Sulfur Flare, 66FL13	100%	32.0	371.0	4.0						1lb ammonia	Malfunction
7/4/03	Unit 43A Sulfur Train	SCOT Unit Incinerator, 43I1	100%	0.5	1,205.0	13.0							Malfunction
7/2/03	Unit 11 Power Failure	SRU Incinerator, 34I1	100%	2.3	29.0	0.3							Malfunction
7/2/03	Unit 11 Power Failure	Non-Corrosive Flare, 66FL4	100%	0.0	13,277.0	144.0	184.0	25.0	1,560.2	4.1			Malfunction
6/27/03	CO Boiler	U29 CO Boiler Stack, 85B1		2.1			22,681.0					150lbs ammonia	Malfunction
5/31/03	Naptha Hydro-desulfurization & Reformer	Refinery East HC Flare, 66FL1		33.0	119.0	1.4	80.0	16.0	173.0				Shutdown
5/30/03	Unit 34 SRU & TGTU	NGL Non-Corrosive Flare, 66FL4	100%	1.4	2,987.0	14.3							Malfunction
5/30/03	Unit 34 SRU & TGTU	SRU Incinerator, 34I1		0.0	50.0	1.0							Malfunction
5/28/03	Tank 5505	Tank Storage, 5505		151.0					17,200.0				Maintenance
5/18/03	Unit 34 SRU & TGTU	SRU Incinerator, 34I1		24.5	4.0								Startup
5/16/03	Interstage Accumulator	Refinery CAT Flare, 66FL3	100%	5.1	6,386.0	69.0	2,429.0	476.0	5,761.0				Malfunction
5/14/03	Unit 34 Turnaround	NGL Non-Corrosive Flare, 66FL4	100%	0.7	3,823.0	39.0		0.1					Maintenance
5/2/03	Unit 34 SRU & TGTU	H ₂ S Emergency Flare, 66FL6	100%	25.1	6,642.0	67.8		0.1					Shutdown

Phillips 66 Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
4/26/03	Butamer Unit	NGL Non-Corrosive Flare, 66FL4	100%	1.4	0.3		92.0	12.0	741.8	2.0			Malfunction
4/26/03	South Off Gas	ARDS HC Flare, 66FL12		0.8	1,000.0	20.0							Malfunction
4/24/03	Unit 40 Valve	U40 CO Boiler Stack, 85B2	50%	0.1									Malfunction
4/14/03	Tank 4030	Tank Storage, 4030		168.0					10,244.0	784.0			Maintenance
4/8/03	Unit 34 SRU	H ₂ S Emergency Flare, 66FL6	100%	4.6	939.0	9.6							Malfunction
4/8/03	Unit 34 SRU	SRU Incinerator, 34I1	100%	4.5	109.0	1.2							Malfunction
3/26/03	Unit 34A Sulfur Train	SCOT Unit Incinerator, 43I1	100%	1.3	19.5	0.2							Malfunction
3/26/03	Unit 44 Sour Water Stripper Feed Surge Drum	ARDS Emergency Sulfur Flare, 66FL13	100%	1.3	227.5	2.5							Malfunction
3/14/03	Pentane Stabilizer Overhead	NGL Non-Corrosive Flare, 66FL4	100%	1.2	2.0	0.1	630.0	83.0	5,068.8	13.0			Malfunction
3/12/03	NGL Column 134 Cyclo-hexane	NGL Non-Corrosive Flare, 66FL4	100%	8.0			1,199.0	166.0	10,159.0				Malfunction
3/11/03	Unit 82 Rich Amine Flash Tank	H ₂ S Emergency Flare, 66FL6	100%	0.8	209.0	8.0	2.0		5.0				Malfunction
2/28/03	Unit 34	SRU Incinerator, 34I1		3.0	88.0	1.0							Startup
2/17/03	Unit 34 SRU & TGRU	H ₂ S Emergency Flare, 66FL6		3.5	490.0	5.0		2.0					Malfunction
2/17/03	Unit 34 SRU & TGRU	SRU Incinerator, 34I1		0.0	102.0	1.0		2.0					Malfunction
2/15/03	Unit 40 Wet Gas Compressor	Refinery CAT Flare, 66FL3		16.1	1,168.0	13.0	7,141.0	87.0	914.0				Malfunction
2/15/03	U29 CO Boiler Stack, 85B1		15%	0.0									Maintenance
2/13/03	Unit 34 Amine Still	SRU Incinerator, 34I1		29.1	258.0	3.0		2.0					Shutdown
2/11/03	Unit 40 CO Boiler	U40 CO Boiler Stack, 85B2	45%	2.8			82,000.0					210lbs ammonia	Malfunction
2/7/03	Unit 34 Incinerator Stack (power loss across street)	NGL Non-Corrosive Flare, 66FL4	100%	4.7	1.0		28.0	4.0	141.0				Malfunction

Phillips 66 Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
2/7/03	Unit 34 Incinerator Stack (power loss across street)	SRU Incinerator, 34I1		0.0	316.0	3.0							Malfunction
2/7/03	Unit 11 Propane Compressor	NGL Non-Corrosive Flare, 66FL4	100%	0.3			18.0	3.0	339.0				Malfunction
2/5/03	Unit 29	Unit 29 COB and ESP, 85B1	70%	2.5									Maintenance
2/4/03	Unit 41 Reformer Furnace	SCOT Unit Incinerator, 43I1		5.0	89.0	1.0							Malfunction
2/4/03	Unit 34 SRU	Unit 34 SRU, 34I1	100%	8.4	4,996.0	54.0		2.0					Malfunction
2/4/03	Unit 41 Reformer Furnace	ARDS Emergency Sulfur Flare, 66FL13	100%	5.0	2,006.0	21.0		3.0				5lbs ammonia	Malfunction
2/3/03	Unit 36	HDS Unit Charge Heater, 36H1	100%	72.0									Maintenance
2/1/03	Unit 29 CO boiler	U29 CO Boiler Stack, 85B1	63%	0.2									Maintenance
2/1/03	Unit 36	Refinery East HC Flare, 66FL1		290.0	2,460.0	28.0	56.0	11.0	29.0				Shutdown
1/24/03	Unit 44 Refinery Stripper	ARDS Emergency Sulfur Flare, 66FL13		48.0	2,593.0	53.0						25lbs ammonia	Maintenance
TOTALS				2,486.1	243,756.0	1,757.4	252,401.0	47,523.7	80,517.2	1,487.8			

PREMCOR REFINING PORT ARTHUR REFINERY • Port Arthur, Jefferson County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/25/04	SRU 544	flare 5		0.6	28,083.5		38.4	5.3					malfunction
1/25/04	SRU 544	flare 5		0.6		305.2							malfunction
1/23/04	CRU	flare 18		12.0			45.7	6.3	108.4				startup
1/21/04	Sulfur Train Shutdown	flare 5		0.2	4,897.0		6.7	0.9					malfunction
1/18/04	Incinerator	incinerator		4.3	1,532.2								malfunction
1/18/04	Incinerator	SCOT		4.3	1,532.2								malfunction
1/18/04	SRU 544	flare 5		24.0	363.0								startup
1/8/04	SRU	flare 5		0.1	631.7		0.9	0.1					malfunction
1/7/04	AVU	flare 19		0.3	2,951.7		8.7	1.2					malfunction
1/6/04	AVU 146	flare 19		0.4	992.3		6.2	0.9					malfunction
1/6/04	SRU	flare 5		0.2	4,332.7		5.9	0.8					malfunction
1/6/04	LHSU-6341	twr 6341		0.2					30,029.2				malfunction
1/5/04	AVU 146	flare 19		0.7	9,022.1	98.0	56.8	7.9	204.4				malfunction
1/5/04	Valve	F-02 flare		6.0			32.8	4.6	238.8				malfunction
1/5/04	Valve	flare 23		6.0					169.7				maintenance
12/30/03	SRU 544	flare 5		48.0		51.8							maintenance
12/30/03	CRU	flare 18		48.0	13.1	0.1	125.8	17.4	292.2				maintenance
12/29/03	GFU 244	flare 2		12.0		13.6			24.1				shutdown
12/29/03	GFU 244	flare 2		24.0	1,256.4		24.1	2.9					shutdown
12/20/03	HCU 942	flare 23		17.0			395.3	54.7					malfunction
12/20/03	HCU 942	HCU 942		15.0		251.9			435.1				malfunction
12/15/03	SRU 545	flare 5		4.3	39,971.7		54.6	7.6					malfunction
12/15/03	SRU 545	SRU 544		4.3		434.4			1.1				malfunction
12/8/03	Dump Valve	flare 23		0.5	811.0	8.8	4.0	1.0	35.5				malfunction
12/5/03	Compressor	flare 19		3.6	2,842.8	30.9	558.6	69.7	1,042.0				malfunction
12/5/03	Compressor	flare b103		3.6	3,593.9	39.1	706.2	88.0	1,665.0				malfunction
11/23/03	Compressor	flare b103		0.7		19.7			774.7				malfunction
11/23/03	Compressor	22 flare	50%	4.0	69,207.0		1,256.0	96.0					malfunction
11/23/03	Compressor	FCC-1241		4.0		750.0			375.2				malfunction
11/7/03	SGRU 1242	cooling twr		168.0					1,744.8				malfunction
11/6/03	SRU 545	incinerator	50%	5.7	271.7		104.1	13.1					malfunction

Premcor Refining Port Arthur Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/6/03	SRU 545	flare 5	20%	0.5	15,467.4	168.1	21.1	2.7	0.4				malfunction
10/29/03	SRU 545	F-545H ₂ S		0.9	616.0	353.6	21.6						malfunction
10/29/03	SRU 543	SRU 543		5.1	1,460.0	48.0							malfunction
10/29/03	SRU 544	SRU 544		0.0	10,086.3	109.6	13.7	2.0					malfunction
10/29/03	Recycle Hydrogen Compressor	E-23 flare		2.5		240.8			173.7				malfunction
10/29/03	Recycle Hydrogen Compressor	E-23 flare	30%	0.9	22,155.0		525.9	72.8					malfunction
10/27/03	Combustion Air Blower	SRU 545	30%	0.0	2,000.0								startup
10/22/03	SRU 545	scot III	30%	2.3	1,280.3	1.0	83.5	7.0					malfunction
10/16/03	42 boiler	boiler house		168.0			5,470.0	5,859.9	51.3			PM: 183.06	maintenance
10/14/03	Power Outage	E-01-942	25%	1.6									malfunction
10/14/03	Power Outage	E-01 SCOT		0.0	77.8	90.0							malfunction
10/14/03	Power Outage	E-03 SCOT		0.0	2,900.5	90.0	223.2	358.5					malfunction
10/14/03	Power Outage	E-23 flare	30%	0.0	75,994.8	825.8	182.3	263.9	2,479.6				malfunction
10/14/03	Power Outage	Flare 22	50%	0.0	2,061.6	1.5	605.0	83.5	67.9				malfunction
10/13/03	43 boiler	boiler house		96.0			3,125.7	3,348.4	29.3			PM: 104.6	maintenance
10/3/03	Docks	marine combuster	100%	1.1			20.2	20.2	68.9			PM 7.6;	malfunction
9/12/03	SRU 544	SRU 544		9.0	388.1								shutdown
9/12/03	SRU	SRU 544		9.0	388.0								startup
9/9/03	SRU 545	E-02 Scot		2.0	912.5								malfunction
9/9/03	SRU 544	E-01Scot		2.0	474.3								malfunction
9/9/03	SRU 544	E-05-Flare		2.0	28,353.6	308.0	38.7	7.1	0.7				malfunction
9/4/03	Debutanizer	SGRU 1242		25.0					361.3				malfunction
8/3/03	SRU	SRU 543		37.0	1,516.0								startup
8/1/03	RTO	RTO		1.1					118.4	37.1			malfunction
7/24/03	SRU 544	E-05 flare		0.2	12,903.8	138.9	5.2	0.7	14.9				malfunction
7/20/03	SRU 543	SRU 543		462.0		4.9							maintenance
7/20/03	SRU 543	SRU 543		65.0	6,592.9								shutdown
7/19/03	SRU	SRU 545		24.0	123.6								startup
7/19/03	SRU	sulfur recovery unit		24.0	123.6								startup
7/13/03	SRU 545	SRU 545 & SWS 8747		24.0	48.0								shutdown

Premcor Refining Port Arthur Refinery, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NO _X	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
7/12/03	HCU 942	Hydrotreating flare		72.0			1,244.0	172.0	61.1				shutdown
6/23/03	RTO	waste H ₂ O treating system		96.0					6,885.5	1,398.8			maintenance
6/19/03	RTO	WWTU 8742		21.3					2,450.7	630.6			malfunction
6/12/03	SRU boiler tube	Incinerator Stack		59.0	4,090.0								shutdown
6/3/03	Volt Buss	F-19 flare		1.0	295.9								malfunction
5/23/03	Compressor	F20 Flare		12.0	18,405.0			144.0	2,976.0				startup
5/23/03	Compressor	FB103 Flare		12.0	1,012.0			24.0					startup
5/18/03	Compressor	flare No. 20		127.0	18,405.0			144.0	2,976.0			nitric oxide 144	shutdown
5/18/03	Compressor	flare No. 22		127.0	506.0			12.0	135.0			nitric oxide 12	shutdown
5/12/03	High Pressure Sperator	flare E-02		0.1	5,041.6	54.7	63.0	8.7	16.0				malfunction
4/12/03	Wet Gas Service Line	F-243		12.0		0.1	0.0		10.1				malfunction
4/7/03	RTO	WWTU 8742		1.9					116.7	27.2			malfunction
4/7/03	Bracket	Spill		4.3								haz waste: 20 bbls	*****
3/13/03	Vacuum Heater Charge Pump	AVU-146		2.5					272.5				malfunction
3/4/03	Wash Water Tower	HFAV-443		0.5			14.3						malfunction
3/3/03	SRU 545	pit vent system		22.0		0.3							maintenance
2/21/03	SRU 544	product sulfur vent system		24.0		0.3							maintenance
2/9/03	Flare system	SRU 543		0.0	500.0	100.0			100.0				startup
2/3/03	Flare system	SRU 543		0.0	500.0	100.0			100.0				shutdown
1/31/03	HFAU- 433	HFAU- 433		0.0	500.0	100.0			100.0				startup
TOTALS				1,982.0	407,485.6	4,739.0	15,088.3	10,909.7	56,706.2	2,093.7	0.0		

SACROC CO₂ TREATMENT PLANT • Snyder, Scurry County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/31/04	C6, C16	GP178		10.8	605.0	7.0	480.0	88.0	693.0				Maintenance
1/29/04	C5 3rd stage cylinder	GP178		1.3	634.0		503.0	92.0					Malfunction
1/28/04	C16 Compressor	GP178		2.0	1,924.0		1,526.0	281.0					Malfunction
1/27/04	Compressor C10	CC178		3.1	1,045.0		829.0	152.0					Malfunction
1/21/04	Cynara Plant 1	GP178		6.4	1,009.0	11.0	814.0	150.0	1,164.0				Malfunction
1/19/04	C15	GP178		2.1	291.0	3.0	235.0	43.0	334.0				Malfunction
1/18/04	unknown	GP178		7.6	271.0	3.0	219.0	40.0	313.0				Malfunction
1/17/04	C15	GP178		8.1	333.0	4.0	268.0	49.0	384.0				Malfunction
1/16/04	C18	GP178		1.5	437.0	5.0	352.0	65.0	504.0				Malfunction
1/15/04	C13	GP178		7.4	937.0	10.0	756.0	139.0	1,080.0				Malfunction
1/14/04	C10	GP178		8.0	346.0	4.0	279.0	51.0	399.0				Malfunction
1/8/04	C12 Compressor Valve	GP178		9.0	2,183.0	24.0	1,760.0	323.0	2,515.0				Malfunction
1/8/04	GP178	GP178		129.0	5,962.0	65.0	4,807.0	883.0	6,868.0				Malfunction
1/7/04	GP178 Cooling Tower Pump	GP178		8.0	462.0	5.0	372.0	68.0	532.0				Malfunction
1/6/04	178 Recompression	GP178		0.6	1,185.0	13.0	956.0	176.0	1,366.0				Malfunction
1/5/04	Inlet and Recompression	GP178		3.2	291.0	3.0	235.0	43.0	334.0				Malfunction
1/5/04	Inlet and Recompression	GP178		15.2	3,283.0	36.0	2,647.0	487.0	3,783.0				Malfunction
12/29/03	C14, K600, C15, C18	GP178		17.5	3,833.0	42.0	3,090.0	568.0	4,416.0				Malfunction
12/26/03	Reinjection Compressors	GP178		6.0	866.0	9.0	698.0	128.0	998.0				Malfunction
12/24/03	C11 Compressor	GP178		2.0	257.0	3.0	207.0	38.0	296.0				Malfunction
12/23/03	Cynara Membrane	GP178		11.7	778.0	8.0	627.0	115.0	897.0				Malfunction
12/23/03	Cynara Membrane	GP178		0.0	863.0	9.0	696.0	128.0	994.0				Malfunction
12/16/03	C13, C14	GP178		4.8	509.2	5.5	609.3	153.0	453.3				Malfunction
12/14/03	C15- C18	GP178		2.5	794.4	8.6	950.6	238.7	707.1				Malfunction
11/26/03	C13 & C14 Injection Compressors	CC178		83.8	34,581.4	375.5			30,862.4			CO ₂ : 25371489.2	Malfunction

SACROC CO₂ Treatment Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
11/25/03	GP176 Pretreatment Heater	GP178		2.0	996.1	10.8	1,127.6	283.1	834.0				Malfunction
11/23/03	Fisher Control Valve	GP178		2.0	910.6	9.9	1,030.8	258.8	762.4				Malfunction
11/22/03	Reinjection Compressors	GP178		4.0	1,883.3	20.4	2,132.0	535.3	1,576.9				Malfunction
11/21/03	Inlet Compressor	GP178		2.9	1,245.6	13.5	1,410.1	353.4	1,043.0				Malfunction
11/20/03	RTD	GP178		3.6	274.4	3.0	310.7	78.0	230.8				Malfunction
11/17/03	Compressors	IC176		12.0	7,489.0	81.3	2,035.9	511.2	6,270.3				Maintenance
11/6/03	Cynara Membrane Plant	Vent Stack 1		0.6		145.1			594.1				Shutdown
10/30/03	Inlet Scrubber V-1000	CC178		0.5		86.5			76,655.5				Malfunction
10/29/03	IC176K800	Flare 176		8.0	7,062.6	76.7	40,711.7	10,222.4	66,179.8				Malfunction
10/24/03	ONCOR	Vent Stack 1		1.5		220.4			23,628.0				Shutdown
10/22/03	ONCOR	Flare 176		48.0	23,599.4	256.2	27,317.8	8,859.3	20,866.3				Shutdown
10/22/03	ONCOR	Flare 178		0.0	8,892.5	96.5	10,293.7	2,584.7	8,051.1				Shutdown
10/22/03	All	Flare 176		4.0	9,880.6	107.3	2,871.8	2,871.8	8,945.6				Shutdown
10/22/03	All	Flare 178		0.0	9,880.6	107.3	2,871.8	2,871.8	8,945.6				Shutdown
10/20/03	Inlet and Recompression Stations	CC178 Vent		5.0		605.0			2,479.2				Malfunction
10/20/03	Inlet and Recompression Stations	Flare		5.0	6,270.4	68.1	7,258.4	1,822.5	5,677.0				Malfunction
10/20/03	Inlet and Recompression Stations	Flare		0.0	6,270.4	68.1	7,258.4	1,822.5	5,677.0				Malfunction
10/15/03	IC176K600	CC178		1.0		137.9			14,658.9				Malfunction
10/14/03	Liquid Pipeline Valve	CC176		15.0	5,814.3	63.1	6,730.5	1,689.7	5,264.2				Malfunction
10/13/03	Snyder	CC178 Vent		11.0		2,224.2			236,417.7				Shutdown
10/13/03	GP176	CC178 Vent		6.0		1,281.9			136,110.2				Malfunction
10/11/03	GP176	CC178 Vent		14.0		2,116.0			224,918.5				Malfunction
10/10/03	GP176	CC178 Vent		13.5		999.5			106,236.0				Malfunction
10/8/03	C-14 & C-16	CC178 Vent		4.0		227.7			24,182.3				Malfunction
10/7/03	C14	CC178 Vent		48.0		455.4			48,404.5				Shutdown
10/3/03	C13 compressor	CC178 Vent		5.5		390.5			39,952.4				Shutdown

SACROC CO₂ Treatment Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/2/03	PSV	CC178 Vent		4.0		532.7			54,502.4				Malfunction
10/1/03	Gas Processing Plant	CC178 Vent		11.0		1,282.2			131,151.6				Malfunction
9/23/03	Thermal Oxidizer	CC17 Vent		1.0		252.6			25,845.6				Malfunction
9/11/03	CC176K800	CC178 Vent		0.5		174.2			17,817.1				Malfunction
8/27/03	CC178-C17, C16	CC178 Vent		0.5		78.2			5,142.7				Malfunction
2/28/03	Incinerator	CC178		0.5	302.8			83.3					Malfunction
2/26/03	Incinerator	CC178 Compressor		1.0	629.7			173.2					Malfunction
TOTALS				607.7	155,082.1	12,845.7	137,277.0	39,519.7	1,368,913.3	0.0	0.0		

SID RICHARDSON CARBON • Borger, Hutchinson County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/26/04	unit 2 off gas fan	upset vent		1.8		630.0	18,018.0	5	340.0			PM: 17	emissions event
1/7/04	#2 off gas	upset vent		1.1		251.0	8,014.0	2	151.0			PM: 8	emissions event
9/3/03	#4 off gas	unit 3		1.9		789.0	41,466.0	6	2,874.0			PM: 21	emissions event
8/29/03	unit 1	unit 1		0.9		148.0	18,337.0	1	200.0			PM: 4	emissions event
8/29/03	#4 off gas	unit 2		0.9		83.0	4,777.0	1	115.0			PM: 2	emissions event
8/29/03	#4 off gas	unit3		1.0		404.0	21,200.0	3	1,469.0			PM: 10	emissions event
8/29/03	#2 boiler	unit4		3.3		815.0	22,633.0	5	891.0			PM: 18	emissions event
8/26/03	wet gas pellet area	unit 4		1.3		182.0	4,986.0	1	196.0			PM: 4	emissions event
8/25/03	wet gas pellet area	unit 2		1.0		366.0	21,210.0	3	515.0			PM: 10	emissions event
8/23/03	#1 off gas fan	unit 1		51.6		15,329.0	672,722.0	116	20,763.0			PM: 415	emissions event
7/24/03	#1 off gas fan	unit 2		0.7		120.0	3,757.0	1	71.0			PM: 4	emissions event
7/2/03	wet gas pellet area	unit 3		3.9		819.0	54,584.0	107	2,887.0			PM: 26	emissions event
6/24/03	#4 off gas	unit 4		72.0		13,769.0	448,336.0	98	17,651.0			PM: 353	emissions event
6/5/03	#2 boiler	unit 4		30.2		12,519.0	686,267.0	95	47,563.0			PM: 340	emissions event
6/3/03	#1 off gas fan	unit 1		44.8		14,478.0	814,052.0	109				PM: 392	emissions event
6/3/03	#1 off gas fan	unit 1		45.8		14,478.0	814,052.0	109	19,569.0			PM: 392	emissions event
5/23/03	#3 off gas	unit 3		10.5		163.0	8,844.0	1	468.0			PM: 4	emissions event
5/11/03	electric generator	unit 4		120.4		22,101.0	698,198.0	137	34,077.0			PM: 486	emissions event
5/11/03	electric generator	unit 4		144.0		32,771.0	817,754.0	174	34,508.0			PM: 621	maintenance
5/11/03	electric generator	unit 1		144.0		19,405.0	741,813.0	125	22,406.0			PM: 448	maintenance
5/11/03	electric generator	unit 2		98.5		28,658.0	847,142.0	224	15,984.0			PM: 799	maintenance
5/11/03	electric generator	unit 3		32.4		10,323.0	544,903.0		37,766.0			PM: 271	maintenance
5/7/03	#2 boiler	unit 3		2.2		22,350.0	32,248.0	4	22,350.0			PM: 16	emissions event
5/7/03	#2 boiler	unit 2		2.2		256.0	7,364.0	2	139.0			PM: 7	emissions event
5/1/03	#2 boiler	unit 1		3.0		821.0	43,169.0	6	1,038.0			PM: 21	emissions event
5/1/03	#2 boiler	unit 2		32.3		8,149.0	438,678.0	59	23,200.0			PM: 211	emissions event
5/1/03	#2 boiler	unit 1		10.5		8,149.0	438,678.0	59	23,200.0			PM: 211	emissions event
4/30/03	#2 boiler	unit 2		8.0		1,739.0	87,166.0	12	4,610.0			PM: 42	emissions event
4/30/03	#2 boiler	unit 3		2.0		1,739.0	87,166.0	12	4,610.0			PM: 42	emissions event
4/23/03	#3 off gas	unit 3		17.5		5,102.0	226,745.0	31	11,991.0			PM: 109	emissions event
4/23/03	#3 off gas	unit 1		5.5		3,306.0	3,306.0	1	102.0			PM: 2	emissions event
4/21/03	#1 boiler	unit 2		3.0		640.0	16,975.0	4	320.0			PM: 16	emissions event

Sid Richardson Carbon, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
4/21/03	#1 boiler	unit 1		3.0		981.0	38,655.0	7	1,193.0			PM: 24	emissions event
4/21/03	#1 boiler	unit2		3.0		640.0	16,975.0	4	320.0			PM: 16	emissions event
4/7/03	#1 boiler	vent 1 & 2 bag filter		0.0		66,126.0	2,909,364.0	274	106,482.0			PM: 1692	emissions event
3/21/03	#3 off gas	borger		1.3		135.0	9,214.0	1	487.0			PM: 4	maintenance
3/6/03	#4 off gas blower	borger		0.0		108.0	6,111.0	1	323.0			PM: 3	maintenance
2/24/03		upset vent 4 bag filter		0.4		149.0	8,419.0	1	445.0			PM: 4	emissions event
2/12/03	#2 boiler	upset vent		1.0		179.0	8,075.0	1	249.0			PM: 5	emissions event
TOTALS				906.5	0.0	309,170.0	11,691,373.0	1,801.4	461,523.0	0.0	0.0		

VALERO CORPUS CHRISTI REFINERY EAST PLANT • Corpus Christi, Nueces County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/21/04	Steam Assist Line to Flare	Complex 8 Flare (EP-Flare-1)	15	6.0									Opacity Event
12/17/03	Hydrocracker Pump	Hydrocracker Flare	15	29.6				64.7					Malfunction
11/24/03	Vacuum Unit	Complex 7 Flare (WP-Flare-1)		7.4	11,721.7	119.6	98.7	13.7	136.1				Maintenance
11/18/03	Vacuum jet compressor	Complex 7 Flare (WP-Flare-1)		8.6	13,622.5	139.0	114.6	15.9	158.1				Maintenance
11/05/03	Complex 6 power failure	SRU-2 Flare		173.7	22,947.5	248.8	30.6	6.0					Malfunction
11/05/03	Power failure	Hydrocracker Flare		173.7	670.8	7.3	3,265.4	640.8	57.1				Malfunction
11/05/03	Power failure	SRU-1 Incinerator		173.7	3,845.5	41.7	5.1	1.0					Malfunction
11/5/03	Complex 6 power failure	Complex 7 Flare		173.7	573.0	6.2	17.1	2.4	32.6				Malfunction
11/5/03	Complex 6 power failure	Complex 7 Flare		173.7	808.9	8.8	12.8	1.8	8.9				Malfunction
11/5/03	Complex 6 power failure	Complex 7 Flare		173.7	2,501.6	27.1	44.4	6.2	28.3				Malfunction
11/5/03	Complex 6 power failure	Complex 7 Flare		173.7	20,366.9	207.8	171.4	23.7	236.4				Malfunction
10/26/03	Overhead receiver reflux pump	Complex 7 Flare (WP-Flare-1)		0.9	1,643.0	17.8	4.8	0.9	2.1				Malfunction
10/6/03	Javelina Plant Shutdown	Complex 7 Flare (WP-Flare-1)		912.0	142.3	1.5	12,944.3	2,005.2	19,130.9				Malfunction
10/2/03	Vacuum jet compressor	WP-Flare-7		2.2	3,795.2	38.7	31.9	4.4	44.1				Malfunction
9/23/03	Vacuum jet compressor	Complex 7 Flare (WP-Flare-1)		3.8	6,555.3	66.9		7.6	76.1				Malfunction
9/17/03	SRU No. 2	SRU No. 2 Incinerator		7.0	561.0	0.6							Malfunction
9/6/03	Vacuum jet compressor	WP-Flare-1		2.8	4,865.0	49.6			56.5				Malfunction
7/24/03	Vacuum jet compressor	WP-Flare-1		72.6	101,451.6	1,035.2	853.8	118.2	1,177.7				Malfunction
7/21/03	Vacuum jet compressor	WP-Flare-1		30.4	42,481.1	433.5	357.5	49.5	493.1				Malfunction
6/9/03	Coker - change of feedstock	Complex 7 Flare (WP-Flare-1)		1.2	721.5	7.8	12.8	1.8	8.2				Malfunction
6/3/03	FCC Unit - soot blowing	FCC CO boiler stack	46	0.1									Opacity Event

Valero Corpus Christi Refinery East Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
5/26/03	Vacuum jet compressor	Complex 7 Flare (WP-Flare-1)		8.9	11,850.0	120.9	99.7	13.8	137.5				Malfunction
5/21/03	Vacuum jet compressor	WP-Flare-1		8.8	4,332.0	44.2	36.5	5.0	50.3				Malfunction
5/7/03	Storage tank 99	ship		36.0					9,603.8	75.9			Malfunction
4/9/03	Vacuum Unit Compressor	WP-Flare-1		5.3	7,448.0	76.0	62.7	8.9	86.5				Malfunction
3/4/03	CO Boiler	Boiler bypass stack		3.0			11,081.8	87.8					Malfunction
2/26/03	Vacuum jet compressor	Complex 7 Flare (WP-Flare-1)		97.5	156,900.2	1,601.2		164.5					Malfunction
2/15/03	Vacuum jet compressor	WP-Flare-1		3.7	9,179.5								Malfunction
2/7/03	Vacuum jet compressor	West plant Flare (WP-Flare-1)		35.8	22,054.7	245.9		38.0					Malfunction
2/3/03	Coker gas compressor	WP-Flare-1		0.8	4,951.0			11.0					Malfunction
TOTALS				2,500.0	455,989.6	4,546.3	29,245.9	3,293.0	31,524.1	75.9	0.0		

VALERO CORPUS CHRISTI REFINERY WEST PLANT • Corpus Christi, Nueces County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/31/04	HR unit	Ground flare		0.4			5.7	0.4	2.3				Shutdown
1/31/04	HR unit	Ground flare		63.0	9.1	0.1	6,248.6	784.9	1,738.8				Shutdown
1/31/04	HRU	CRU heater stack		8.0			0.2	19.4					Shutdown
1/23/04	BUP Turnaround	MTBE flare		35.8			68.3	9.5	197.9				Startup
1/23/04	BUP unit	MTBE flare	30	4.0									Startup (opacity)
1/23/04	BUP Turnaround	MTBE Flare		35.8			38.3	22.6	31.8				Startup
1/10/04	BUP unit	MTBE flare		1.2			41.9	5.8	99.0				Shutdown
12/18/03	Recycle compressor	Ground flare		4.0			1,823.7	540.3	1,364.5				Malfunction
12/17/03	Tank	Tank vent		24.0					144.7				Malfunction
12/16/03	HDS Unit	SMR Water Stack		3.0			1,690.2	1,458.3					Malfunction
12/14/03	HDS recycle compressor	Acid gas flare		0.6	1,305.5	14.2	2.6	0.3					Malfunction
12/14/03	HDS Recycle compressor	Main flare		3.6	9,363.6	101.5	494.5	151.8	361.6				Malfunction
12/14/03	HDS recycle	Main Flare		117.8	50,870.5	551.5	5,775.8	51.1	384.0				Malfunction
12/14/03	HDS Recycle	Main Flare		118.4	58,854.9	638.1	882.2	146.6	1,684.8				Malfunction
12/14/03	HDS Drum	Acid Gas Flare		0.4	817.4	8.9	1.6	0.2	0.1				Malfunction
12/12/03	Amine flash drum	Acid gas flare		0.4	0.1	0.0							Malfunction
12/12/03	Compressor	Ground Flare		4.0	0.9	0.0	479.5	259.1	577.3				Malfunction
12/10/03	High stage compressor	CRU heater stack		13.0				1,235.5					Malfunction
12/6/03	PSA feed valve	SMR heater stack		8.0			4.7	463.8					Malfunction
11/18/03	Glycol exchange & Javalina plant shut down	Ground flare		295.5	8.3	0.1	8,731.5	1,249.2	2,018.1				Malfunction
11/18/03	Glycol exchange & Javalina plant	CRU heater stack		295.5			61.8	4,697.8					Malfunction
10/28/03	Fin fan fan belt	Main flare		0.2	2,624.2	28.5	9.1	1.1	0.7				Malfunction
10/16/03	HDS offgas compressor	Main flare		1.4	778.0	8.4	24.6	3.8	48.7				Malfunction
10/14/03	Javalina Plant shut down	CRU heater stack		760.7			94.6	10,683.9					Malfunction
10/12/03	HSD, SMR & SWS	Ground flare		38.0	1.8	0.0	484.1	275.5	559.3				Startup
10/12/03	HDS, SMR & SWS	Main flare		38.0	9,786.5	106.1	420.8	69.1	64.5				Startup
10/12/03	HDS, SMR & SWS	Main flare		38.0	1,146.6	12.4	259.2	6.3	10.2				Startup

Valero Corpus Christi Refinery West Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/12/03	HDS, SMR & SWS	Main flare		38.0	2,676.1	29.0	614.2	86.4	190.0				Startup
10/12/03	HDS, SMR & SWS	Main flare		38.0	2,067.0	22.4	943.0	152.3	476.9				Startup
9/26/03	Hydrogen make up compressor	Main flare		134.0			450.1	1,101.3	93.4				Shutdown
9/26/03	HDS, SMR & HDS Amine Unit	Acid gas flare		62.0	688.3	7.5	1.4	0.2					Shutdown
9/26/03	HDS, SMR & HDS Amine Unit	Ground flare		62.0	17.0	0.2	11,174.6		5,017.6				Shutdown
9/26/03	HDS, SMR & HDS Amine Unit	Main flare		62.0	4,948.5	53.7	235.8	64.2	142.0				Shutdown
9/26/03	HDS, SMR & HDS Amine Unit	Main flare		62.0	1,355.0	14.7	110.6	1.4	10.2				Shutdown
9/26/03	HDS, SMR & HDS Amine Unit	Main flare		62.0	3,969.6	43.0	144.9	22.1	249.6				Shutdown
9/26/03	Hydrogen make-up compressor	Main flare		134.0			2,269.6	5,685.6	28.6				Shutdown
9/15/03	Coaxial cable cut	Main flare		51.3	825.6	9.0	2.9	0.3	0.2				Malfunction
9/7/03	SMR heater	SMR heater stack		18.0			342.9	336.3					Malfunction
8/30/03	(Not identified)	Flare		2,925.4				171.0					Malfunction
8/22/03	Roof on Tank	Tank 63 vent		18.0					3,924.0	45			Maintenance
8/20/03	NHT	Main flare		234.5			155.0	24.7	235.0				Malfunction
8/20/03	NHT	CRU heater stack		234.5			16.2	742.8					Malfunction
8/8/03	HDS offgas compressor	Ground flare		11.5	0.9	0.0	7,063.6	1,295.0	9,062.9				Malfunction
8/8/03	HDS offgas compressor	Main flare		11.5	2,858.1	31.0	159.5	48.4	115.2				Malfunction
8/8/03	HDS offgas compressor	Main flare		11.5	74,080.7	803.2	4,799.9	74.4	559.3				Malfunction
8/8/03	HDS offgas compressor	Main flare		11.5	23,435.1	254.1	487.7	75.5	935.8				Malfunction
8/6/03	HDS Amine Unit	Main flare		5.4	185.8	2.0	0.0	0.0					Malfunction
8/6/03	HDS Amine Unit	Acid gas flare		5.4	46,271.4	501.7	90.6	10.6	0.0				Malfunction
8/6/03	HDS Amine Unit	Main flare		5.4	13,023.6	141.2	316.6	477.5	918.4				Malfunction
8/6/03	HDS Amine Unit	Acid gas flare		5.4	38,753.8	420.2	77.9	9.1	3.6				Malfunction
8/6/03	HDS Amine Unit	Acid gas flare		5.4	13,351.2	144.8	0.4	3.1	0.3				Malfunction
8/6/03	HDS Amine Unit	Main flare		5.4	7,617.5	81.2	24.7	2.9	2.0				Malfunction
7/30/03	Power loss	Main flare		9.6	5,319.4	55.1	17.6	2.1	1.4				Malfunction

Valero Corpus Christi Refinery West Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
7/30/03	Sulften stripper - power loss	Acid gas flare		9.6	6,532.4	70.8	158.8	22.0	460.7				Maintenance
7/27/03	SMR heater	SMR heater stack		31.0	0.9	0.0	8,592.8	2,019.8	7,184.8				Malfunction
7/23/03	SRU #3	Belco stack		48.0	1,203.6								Malfunction
7/16/03	Flue gas expander	Belco		203.5	4,978.3	19.8	37,551.6	1,116.4	4,614.1				Malfunction
7/15/03	HDS feed	Main flare		52.0	3,035.8	32.6	12.0	1.4	1.5				Malfunction
7/9/03	SMR heater	SMR heater stack		11.0			164.5	177.4	5.8				Malfunction
6/27/03	Steam header	Acid gas flare		0.7	1,612.2	17.5	3.2	0.3	0.2				Malfunction
6/22/03	HDS Amine Unit	Main flare		78.0	7,807.2	47.5	9.2	1.5	0.8				Malfunction
6/17/03	Net gas compressor	Ground flare		52.0			357.8	448.0	2,662.2				Maintenance
6/10/03	SMR unit	SMR heater		40.0			442.1	410.2					Malfunction
6/2/03	Flue gas expander	Belco		9.0			5,586.3						Malfunction
5/16/03	Naptha flush drum	Main flare		11.0	2,520.9	27.3	85.9	9.2	32.7				Malfunction
5/16/03	Waste heat boiler	Halo flare		48.3	1,383.7	14.8	2,168.6	274.4	920.2				Malfunction
5/8/03	Net gas compressor	Ground flare		3.0			987.1	345.4	2,079.9				Malfunction
4/25/03	HOC unit	Main flare		4.0	4,320.1	46.8	15.0	1.7	1.2				Malfunction
4/22/03	Combustion air blower	SRU		1.1	3,990.0								Malfunction
4/8/03	SMR furnace	SMR furnace stack		12.0			21.0	245.4					Malfunction
3/25/03	Compressor motor insulation	Oleflex unit		29.4				171.6					Malfunction
3/11/03	HDS	Acid gas flare		76.4	5,071.2	55.0	0.1	1.2	0.1				Malfunction
3/11/03	HDS	EPN 158		76.4	9,679.1	104.9	803.4	151.2	666.1				Malfunction
3/11/03	HDS	Main flare		76.4	21,795.8	236.3	639.2	102.3	614.5				Malfunction
3/2/03	HDS # 12	Acid gas flare		6.7	6,441.0	69.8	0.2	1.5	0.2				Malfunction
3/2/03	HDS #12	Main flare		6.7	6,807.0	73.8	23.6	2.7	1.9				Malfunction
2/25/03	Debutanizer tower	CRU unit 49		16.0			150.0	472.0					Malfunction
2/19/03	SMR Unit	Main flare		31.0			811.8	263.0	492.6				Malfunction
2/5/03	HDS	HDS Amine unit		9.8	149,077.0	1,615.0	2,505.3	392.5	1,980.0				Malfunction
TOTALS				7,079.4	613,267.8	6,515.4	118,231.8	39,154.2	52,974.1	45.0	0.0		

WASSON CO₂ REMOVAL • Denver City, Yoakum County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/28/04	inlet compressor	flare		259.6	16,471.0	178.6	7,785.0	908.0	6,215.0				malfunction
1/27/04	field electrical feeder	flare		16.0	7,031.0	76.2	3,323.0	387.6	2,653.0				maintenance
1/16/04	inlet compressor	flare		80.5	554.0	6.0	262.0	30.5	209.0				malfunction
1/8/04	#3 inlet compressor	flare		7.6	1,485.0	16.1	702.0	81.9	561.0				malfunction
1/7/04	inlet compressor	flare		103.5	7,962.0	86.3	438.9	3,763.0	3,004.0				malfunction
1/5/04	sat F big compressor	flare		2.4	619.0	6.7	293.0	34.1	234.0				malfunction
1/5/04	#4 inlet compressor	flare		3.9	990.0	10.7	468.0	54.6	374.0				malfunction
1/4/04	#3 inlet compressor	flare		83.5	6,341.0	68.7	2,997.0	349.6	2,393.0				malfunction
1/3/04	plant fuel gas system	flare		6.9			1,398.0	163.1					malfunction
12/7/03	#2 inlet compressor	flare		2.6	606.0	6.6	281.0	32.7	224.0				malfunction
12/3/03	#1 inlet compressor	flare		3.2	735.0	8.0	348.0	40.5	277.0				malfunction
11/23/03	#2 inlet compressor	flare		22.6	3,194.0	34.6	1,510.0	176.1	1,205.0				malfunction
11/21/03	#1 inlet compressor	flare		3.2	2,149.0	23.3	1,016.0	118.4	811.0				malfunction
11/16/03	#1 inlet compressor	flare		3.2	854.0	9.3	404.0	898.7	322.0				malfunction
11/11/03	#1 inlet compressor	flare		8.0	614.0	6.7	284.0	33.2	227.0				malfunction
11/5/03	#2 inlet compressor	flare		6.9	1,188.0	12.9	562.0	65.5	448.0				maintenance
11/1/03	#1 inlet compressor	flare		3.9	753.0	8.2	356.0	41.5	284.0				malfunction
10/27/03	#2 inlet compressor	flare		4.4	1,139.0	12.4	538.0	62.7	430.0				malfunction
10/21/03	york compressor	flare		10.7	1,154.0	12.5	729.0	84.9	437.0				malfunction
10/17/03	#3 inlet compressor	flare		18.7	1,585.0	17.2	749.0	87.4	598.0				malfunction
10/14/03	#3 inlet compressor	flare		3.4	817.0	8.9	391.0	45.6	312.0				malfunction
10/11/03	inlet compressor	flare		2.3	1,089.0	11.8	629.0	73.3	419.0				malfunction

Wasson CO₂ Removal, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
10/6/03	#3 inlet compressor	flare		14.4	2,166.0	23.5	1,024.0	119.4	817.0				malfunction
10/4/03	#3 inlet compressor	flare		3.1	616.0	6.7	291.0	34.0	233.0				malfunction
10/2/03	K5A recycle compressor	flare		1.6	841.0	9.1	277.0	32.2	271.0				malfunction
9/23/03	V8-305	flare		170.1	30,882.0	334.8	14,597.0	1,702.4	11,653.0				maintenance
9/21/03	#2 york	FEI/flare		7.5			1,558.0	181.8	13.0				malfunction
9/18/03	inlet compressor	FEI/flare		5.8	815.0	8.8	385.0	44.9	307.0				maintenance
9/14/03	#3 inlet compressor	flare		3.7	631.0	6.8	345.0	40.2	239.0				malfunction
9/13/03	#4 inlet compressor	flare		5.2	1,146.0	12.4	594.0	69.3	433.0				malfunction
9/9/03	#3 inlet compressor	FEI/flare		108.5	25,394.0	275.3	12,003.0	1,399.9	9,582.0				malfunction
9/8/03	compressor	flare		13.1	2,444.0	26.5	1,155.0	134.7	922.0				malfunction
9/8/03	valve	flare		10.3	1,758.0	19.1	831.0	96.9	663.0				maintenance
8/28/03	generator	flare		23.1	4,729.0	51.3	2,235.0	260.6	1,784.0				malfunction
8/25/03	inlet compressor	FEI/flare		59.4	10,621.0	115.2	5,020.0	585.5	4,008.0				maintenance
8/24/03	#2 inlet compressor	flare		5.1	1,109.0	12.0	514.0	59.9	410.0				malfunction
8/11/03	#1 inlet compressor	FEI/flare		8.1	2,020.0	21.9	936.0	109.2	747.0				malfunction
8/9/03	#1 inlet compressor	FEI/flare		14.6	2,131.0	23.1	2,883.0	336.2	802.0				malfunction
7/31/03	power failure	flare		2.8	675.0	7.3	319.0	37.2	255.0				malfunction
7/31/03	plant shutdown	flare		201.7	83,486.0	905.1	39,461.0	4,602.3	31,503.0				maintenance
7/31/03	sattelite B	flare		72.0	5,345.0	58.0	2,064.0	240.0	1,498.0				maintenance
7/31/03	sattelite C	flare		94.0	19,714.0	214.0	7,359.0	858.0	5,691.0				maintenance
7/31/03	sattelites A,D,E,J,K	flare		72.0	788.0	9.0	746.0	86.0	227.0				maintenance
7/31/03	tank battery 1	flare		96.0	1,848.0	20.0	744.0	86.0	534.0				maintenance
7/31/03	tank battery 2	flare		96.0	2,005.0	22.0	829.0	97.0	579.0				maintenance
7/30/03	inlet 1,2; york	flare		4.6	1,411.0	15.3	667.0	77.8	533.0				malfunction
7/17/03	inlet compressor	flare		36.6	2,402.0	26.0	1,135.0	132.4	906.0				maintenance
7/11/03	#1inlet compressor	FEI/flare		6.2	1,116.0	12.1	517.0	60.3	413.0				malfunction
6/20/03	valve	flare		5.9	735.0	8.0	348.0	40.5	277.0				maintenance

Wasson CO₂ Removal, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
6/12/03	#1 inlet gas compressor	flare		4.0	740.0	8.0	350.0	40.8	279.0				malfunction
5/29/03	#2inlet compressor	flare		6.6	2,330.0	25.3	1,101.0	128.4	879.0				malfunction
5/27/03	valve	flare		1.4	376.0	4.1	178.0	20.7	142.0				maintenance
5/19/03	Sat F west compressor	flare		12.7	826.0	9.0	383.0	44.6	305.0				malfunction
5/12/03	turbine	flare		9.3			80.0	9.4					maintenance
5/4/03	#2 inlet compressor	flare		4.1	1,263.0	13.7	585.0	68.2	467.0				malfunction
5/1/03	PIC-102	flare		112.9	5,420.0	58.8	2,562.0	298.7	2,045.0				malfunction
4/29/03	inlet compressor	flare		120.5	6,868.0	74.5	3,246.0	378.6	2,592.0				maintenance
4/23/03	inlet compressor	flare		3.4	1,313.0	14.2	1,022.0	119.2	489.0				malfunction
4/12/03	#1 inlet compressor	flare		2.4	657.0	7.1	304.0	35.5	243.0				malfunction
3/28/03	#2 york compressor	FEI/flare		22.4	1,510.0	16.4	2,028.0	236.5	579.0				malfunction
3/27/03	#4 inlet compressor	flare		11.8	3,864.0	41.9	3,014.0	351.6	1,573.0				malfunction
3/21/03	# 2 inlet compressor	flare		21.3	64,467.0	698.9	30,471.0	3,553.8	24,326.0				malfunction
3/20/03	compressor valve	FEI/flare		2.4	867.0	9.4	410.0	47.8	327.0				maintenance
3/13/03	inlet compressor	flare		12.7	3,199.0	34.7	1,512.0	176.3	1,207.0				malfunction
3/10/03	inlet compressor	FEI/flare		259.3	25,441.0	275.8	12,025.0	1,402.4	9,600.0				maintenance
3/4/03	phase A	flare		4.0	505.0	5.5	505.0	58.8	193.0				malfunction
2/7/03	#1 york	flare		6.3	808.0								malfunction
TOTALS				1,985.3	384,612.0	4,162.3	184,076.9	25,677.2	142,183.0	0.0	0.0		

WELCH CO₂ GAS PROCESSING FACILITY • Welch, Dawson County
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compounds	Butadiene	Other Emissions	Type of Event
1/29/04	CO ₂ plant	Flare		3.7	3032	32.9	180	21.1	190				Malfunction
12/11/03	U201 Compressor	Flare		1.5	78.0	0.8	2.0	0.3	9.0				Malfunction
9/25/03	CO ₂ plant	Flare		1.7	517	5.6	45	5.2	44				Malfunction
9/20/03	U201 Compressor	Flare		7.0	2070	22.5	153	17.9	141.0				Malfunction
9/5/03	U201 Compressor	Flare		6.3	976	10.6	72	8.4	66				Malfunction
8/29/03	U202 Compressor	Flare		1.8	2297	24.9	170	19.8	156				Malfunction
8/25/03	U202 Compressor	Flare		3.0	1043	11.3	77	9.1	71				Malfunction
8/22/03	Flare Field Gas	Flare		480.0	9200	99.7	681	79.4	625				Malfunction
8/19/03	U202 Compressor	Flare		7.3	1479	16	109	12.7	101				Malfunction
8/11/03	PLC #1	Flare		1.0	1466	15.9	127	14.7	124				Malfunction
8/4/03	Dehydration System	Flare		149.5	100404	1088.6	8674	1011.7	8494				Malfunction
7/28/03	U202 Compressor	Flare		10.5	1139	12.4	84	9.8	77.0				Malfunction
6/29/03	CO ₂ plant	Flare		2.0	872	9.5	75	8.8	74.0				Malfunction
6/24/03	CO ₂ plant	Flare		3.1	1299	14.1	112	13.1	110				Malfunction
6/18/03	PLC#1	Flare		2.0	713	7.7	62	7.2	60				Malfunction
6/5/03	CO ₂ plant	Flare		4.0	5897	63.9	510	59.5	499				Malfunction
6/4/03	CO ₂ plant	Flare		15.5	20115	218.1	1738	202.6	1702				Maintenance
6/1/03	CO ₂ plant	Flare		8.0	4126	44.7	356	41.6	349				Malfunction
5/20/03	CO ₂ plant	Flare		4.0	3005	32.6	260	30.3	254				Malfunction
5/13/03	U202 Compressor	Flare		100.5	9168	99.4	678	79.2	623				Malfunction
4/7/03	U101 Compressor	Flare		2.0	1293	14	85	9.9	100				Maintenance
4/7/03	U101 Compressor	7B/Flare		6.0	3305	35.8	217	25.3	255				Maintenance
3/31/03	U101 Compressor	Flare		2.5	1377	14.9	90	10.5	106				Maintenance
3/21/03	CO ₂ plant	Flare		2.0	1832	19.9	158	18.4	155				Malfunction
3/12/03	U201 Compressor	7B		2.3	706	7.7	48	5.6	50				Malfunction
2/20/03	U202 Compressor	Flare		187.2	23822	258.3	1620	188.9	1693				Malfunction
2/2/03	U201 Compressor	7B		151.7	12679	137.5	862	100.0	901				Malfunction
TOTALS				1165.9	213,910.0	2,319.3	17,245.0	2,011.0	17,029.0	0.0	0.0		

WESTERN REFINING EL PASO NORTH PLANT • El Paso, El Paso County TX
Emissions Data (Lbs./Event): 1.31.03 – 1.31.04

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compound	Butadiene	Other Emissions	Type of Event
1/24/04	SRU Incinerator	SRU Incinerator	25	8.0	2,554.0								Malfunction
1/22/04	FCCU WCG	Main Process Flare		0.6	7,062.0	77.0		46.0				Liquefied petroleum gas (LPG) :776	Malfunction
1/22/04	Entire Facility	Main Process Flare		552.0	32,584.0	346.0		50.0					Shutdown
1/22/04	Entire Facility	SWS flare EPN 128		552.0	6,079.0	65.0		50.0					Shutdown
12/29/03	FCCU	Refinery Amine System		6.0	3,273.0	35.0		2.0					Malfunction
12/29/03	FCCU	Sour Water Stripper (SWS)		6.0	1,660.0	18.0		6.0				NH ₃ : 6	Malfunction
12/28/03	Truck Rack	Spill		0.0								Diesel	Excess Opacity
12/22/03	SRU flow meter	South SRU Incinerator	100	2.0	1,400.0			1.0					Malfunction
12/22/03	SRU flow meter	SWS		1.0	557.0	6.0		1.0				NH ₃ : 2	Malfunction
12/22/03	SRU flow meter	SWS Flare		0.0	557.0	6.0		1.0				NH ₃ : 2	Malfunction
11/22/03	SWS	SWS		3.0	1,159.0	12.0		2.0				NH ₃ : 5	Malfunction
11/15/03	SRU SWS	SWS Flare		25.0	6,290.0	67.0		16.0				NH ₃ : 22	Malfunction
11/9/03	#6 Crude Unit	#6 Crude Unit		0.9		8.0			7,728.0	172.0		LPG: 60	Malfunction
11/9/03	NHT Compressor	Main Flare		0.8	55.0		40.0	3.0				LPG 41	Malfunction
9/17/03	Flare Line	Flare Line		2.5		84.1			28.0	28.0			Malfunction
8/30/03	Compressor	Main Flare Line		6.5	1,107.0	12.0		3.0	28.0				Malfunction
8/3/03	#6 Crude Unit	#6 Crude Unit		20.0		7.0			50.0				Malfunction
7/26/03	Main flare	Main Process Flare		2.0	1,453.0	15.0	210.0	81.0				LPG: 346	Malfunction
7/26/03	SRU Incinerator	SRU Incinerator		1.0	437.0								Malfunction
7/24/03	Fuel Gas System Treater	Boiler Stack	0	0.2									Excess Opacity
7/21/03	Fuel Gas System Treater	Stack	1	0.2									Excess Opacity
6/24/03	Relief Gas Fuel Gas Compressor	Refinery Relief Fuel Gas System		744.0	240.0	4.0	161.0	19.0				LPG: 173	Maintenance
6/2/03	#6 Crude Unit	Furnace F1601		24.0	500.0								Malfunction
6/2/03	#6 Crude Unit	Furnace F1602		24.0	500.0								Maintenance
6/2/03	#6 Crude Unit	Main Flare		24.0	481.0				554.0				Maintenance
5/13/03	Rich Amine Pump	South Main Flare		0.3	354.0	4.0							Malfunction

Western Refining El Paso North Plant, continued

Start Date	Unit	Emission Point	Opacity (%)	Duration (hrs.)	SO ₂	H ₂ S	CO	NOX	Total VOCs	Benzene Compound	Butadiene	Other Emissions	Type of Event
5/13/03	Rich Amine Pump	SWS EPN 128		0.3	152.0	2.0						NH ₃ : 1	Malfunction
5/13/03	Rich Amine Pump	SWS		0.0	400.0	4.0		4.0					Malfunction
4/13/03	Crude Unit Off Gas Compressor	Crude Unit		26.0	554.0	6.0		13.0	130.0				Malfunction
2/26/03	FCCU Regenerator	WGS Stack		10.0								Opacity exceeded	Startup
2/14/03	FCCU Regenerator	SWS Flare		301.0	31,646.0	336.0		140.0				NH ₃ : 184	Maintenance
2/14/03	FCCU Regenerator	Main Process Flare		301.0	40,142.0	427.0		49.0					Maintenance
TOTALS				2,644.3	141,196.0	1,541.1	411.0	487.0	8,518.0	200.0	0.0		



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